

**DIPLOMADO DE PROFUNDIZACIÓN CISCO (DISEÑO E IMPLEMENTACIÓN  
DE SOLUCIONES INTEGRADAS LAN / WAN)**

**SEBASTIAN PEÑA CASTAÑEDA**

**UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA  
FACULTAD DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA  
INGENIERÍA DE SISTEMAS  
PALMIRA – VALLE DEL CAUCA**

**2019**

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**Prueba Final de Habilidades Prácticas**

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**UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA  
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## INTRODUCCIÓN

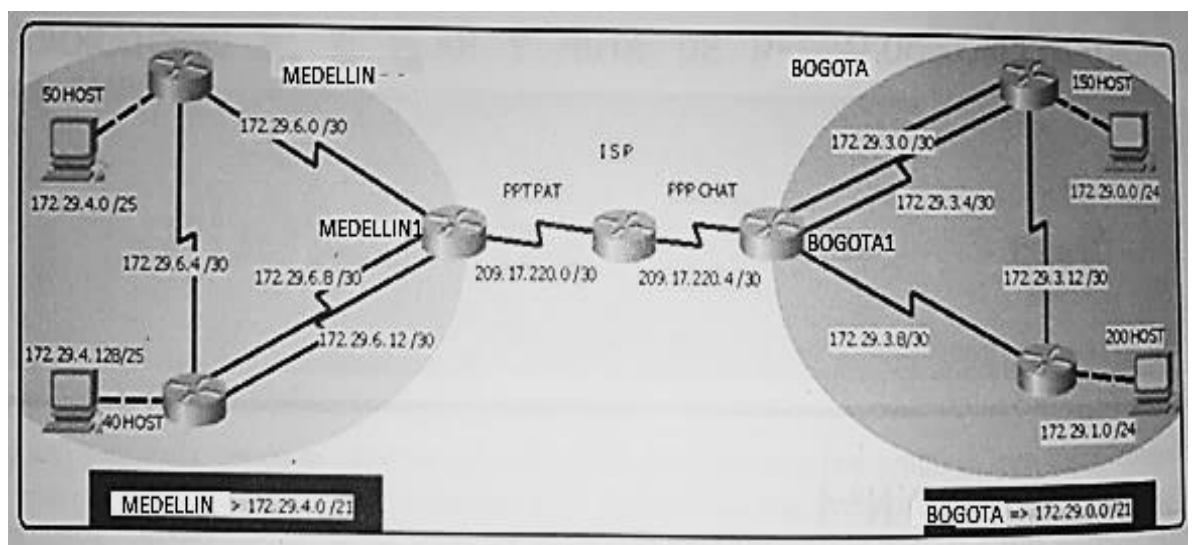
En el trabajo se desarrolla la escena propuestas en el documento “Evaluación – Prueba de habilidades prácticas CCNA” Diplomado de Profundización CCNA. El desarrollo de las actividades se llevó a cabo por medio del software Packet Tracer, mediante la cual se identificaron, desarrollaron los temas como routing switching y configuración avanzada y básica de redes.

## DESARROLLO ESCENARIO 1

### Escenario 1

Una empresa posee sucursales distribuidas en las ciudades de Bogotá y Medellín, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

Topología de red



Este escenario plantea el uso de RIP como protocolo de enrutamiento, considerando que se tendrán rutas por defecto redistribuidas; asimismo, habilitar el encapsulamiento PPP y su autenticación.

Los routers Bogota2 y medellin2 proporcionan el servicio DHCP a su propia red LAN y a los routers 3 de cada ciudad.

Debe configurar PPP en los enlaces hacia el ISP, con autenticación.

Debe habilitar NAT de sobrecarga en los routers Bogota1 y medellin1.

Desarrollo

Como trabajo inicial se debe realizar lo siguiente.

- Realizar las rutinas de diagnóstico y dejar los equipos listos para su configuración (asignar nombres de equipos, asignar claves de seguridad, etc).
- Realizar la conexión física de los equipos con base en la topología de red

Configurar la topología de red, de acuerdo con las siguientes especificaciones.

### Parte 1: Configuración del enrutamiento

- a. Configurar el enrutamiento en la red usando el protocolo RIP versión 2, declare la red principal, desactive la sumarización automática.
- b. Los routers Bogota1 y Medellín deberán añadir a su configuración de enrutamiento una ruta por defecto hacia el ISP y, a su vez, redistribuirla dentro de las publicaciones de RIP.
- c. El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se sumarizan las subredes de cada uno a /22.

### Parte 2: Tabla de Enrutamiento.

- a. Verificar la tabla de enrutamiento en cada uno de los routers para comprobar las redes y sus rutas.
- b. Verificar el balanceo de carga que presentan los routers.
- c. Obsérvese en los routers Bogotá1 y Medellín1 cierta similitud por su ubicación, por tener dos enlaces de conexión hacia otro router y por la ruta por defecto que manejan.
- d. Los routers Medellín2 y Bogotá2 también presentan redes conectadas directamente y recibidas mediante RIP.
- e. Las tablas de los routers restantes deben permitir visualizar rutas redundantes para el caso de la ruta por defecto.
- f. El router ISP solo debe indicar sus rutas estáticas adicionales a las directamente conectadas.

### Parte 3: Deshabilitar la propagación del protocolo RIP.

- a. Para no propagar las publicaciones por interfaces que no lo requieran se debe deshabilitar la propagación del protocolo RIP, en la siguiente tabla se indican las interfaces de cada router que no necesitan desactivación.

ROUTER	INTERFAZ
Bogota1	SERIAL0/0/1; SERIAL0/1/0; SERIAL0/1/1
Bogota2	SERIAL0/0/0; SERIAL0/0/1
Bogota3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
Medellín1	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/1
Medellín2	SERIAL0/0/0; SERIAL0/0/1
Medellín3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0

Parte 4: Verificación del protocolo RIP.

- a. Verificar y documentar las opciones de enrutamiento configuradas en los routers, como el passive interface para la conexión hacia el ISP, la versión de RIP y las interfaces que participan de la publicación entre otros datos.
- b. Verificar y documentar la base de datos de RIP de cada router, donde se informa de manera detallada de todas las rutas hacia cada red.

Parte 5: Configurar encapsulamiento y autenticación PPP.

- a. Según la topología se requiere que el enlace Medellín1 con ISP sea configurado con autenticación PAT.
- b. El enlace Bogotá1 con ISP se debe configurar con autenticación CHAT.

Parte 6: Configuración de PAT.

- a. En la topología, si se activa NAT en cada equipo de salida (Bogotá1 y Medellín1), los routers internos de una ciudad no podrán llegar hasta los routers internos en el otro extremo, sólo existirá comunicación hasta los routers Bogotá1, ISP y Medellín1.
- b. Después de verificar lo indicado en el paso anterior proceda a configurar el NAT en el router Medellín1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Medellín1, como diferente puerto.
- c. Proceda a configurar el NAT en el router Bogotá1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Bogotá1, como diferente puerto.

Parte 7: Configuración del servicio DHCP.

- a. Configurar la red Medellín2 y Medellín3 donde el router Medellín 2 debe ser el servidor DHCP para ambas redes Lan.
- b. El router Medellín3 deberá habilitar el paso de los mensajes broadcast hacia la IP del router Medellín2.
- c. Configurar la red Bogotá2 y Bogotá3 donde el router Medellín2 debe ser el servidor DHCP para ambas redes Lan.
- d. Configure el router Bogotá1 para que habilite el paso de los mensajes Broadcast hacia la IP del router Bogotá2.

## Configuración del Router MEDELLIN1

```
Router(config)#hostname MEDELLIN1 MEDELLIN1(config)#no ip
domain-lookup MEDELLIN1(config)#enable secret class
MEDELLIN1(config)#line console 0 MEDELLIN1(config-line)#password
cisco MEDELLIN1(config-line)#login MEDELLIN1(config-line)#line vty 0
4 MEDELLIN1(config-line)#password cisco MEDELLIN1(config-
line)#login MEDELLIN1(config-line)#exit MEDELLIN1(config)#service
password-encryption

MEDELLIN1(config)#banner motd "Prohibido el acceso no autorizado"

MEDELLIN1(config)#interface s0/0/0

MEDELLIN1(config-if)#description connection medellin-1_medellin- 2

MEDELLIN1(config-if)#ip address 172.29.6.1 255.255.255.252

MEDELLIN1(config-if)#clock rate 128000 MEDELLIN1(config-if)#no
shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
MEDELLIN1(config-if)#exit

MEDELLIN1(config)#interface s0/1/1

MEDELLIN1(config-if)#description connection medellin-1_medellin- 3

MEDELLIN1(config-if)#ip address 172.29.6.13 255.255.255.252

MEDELLIN1(config-if)#clock rate 128000 MEDELLIN1(config-if)#no
shutdown

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
MEDELLIN1(config-if)#exit

MEDELLIN1(config)# interface s0/0/1 MEDELLIN1(config-if)#
description connection medellin- 1_medellin-3

MEDELLIN1(config-if)#ip address 172.29.6.9 255.255.255.252

MEDELLIN1(config-if)#clock rate 128000 MEDELLIN1(config-if)#no
shutdown MEDELLIN1(config)#interface s0/1/0

MEDELLIN1(config-if)#description connection Medellin1_ISP
MEDELLIN1(config-if)#ip address 209.17.220.2 255.255.255.252

MEDELLIN1(config-if)#no shutdown
```



## Configuración del Router MEDELLIN2

```
Router(config)#hostname MEDELLIN2 MEDELLIN2(config)#no ip
domain-lookup MEDELLIN2(config)#enable secret class
MEDELLIN2(config)#line console 0
```

```
MEDELLIN2(config-line)#password cisco MEDELLIN2(config-line)#login
MEDELLIN2(config-line)#line vty 0 4 MEDELLIN2(config-line)#password
cisco MEDELLIN2(config-line)#login MEDELLIN2(config-line)#exit
MEDELLIN2(config)#service password-encryption
```

```
MEDELLIN2(config)#banner motd "Prohibido el acceso no autorizado"
```

```
MEDELLIN2(config)#interface s0/0/1 MEDELLIN2(config-if)#description
connection medellin-3
```

```
MEDELLIN2(config-if)#ip address 172.29.6.5 255.255.255.252
```

```
MEDELLIN2(config-if)#clock rate 128000 MEDELLIN2(config-if)#no
shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
```

```
MEDELLIN2(config)#interface g0/1
```

```
MEDELLIN2(config-if)#description connection medellin2_Pc-M
```

```
MEDELLIN2(config-if)#ip address 172.29.4.1 255.255.255.128
```

```
MEDELLIN2(config-if)#no shutdown
```

```
MEDELLIN2(config-if)#
```

```
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1,
changed
```

```
state to up MEDELLIN2(config)#interface s0/0/0
```

```
MEDELLIN2(config-if)#description connection medellin-2_medellin- 1
```

```
MEDELLIN2(config-if)#ip address 172.29.6.2 255.255.255.252
```

```
MEDELLIN2(config-if)#no shutdown
```

```
MEDELLIN2(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

## Configuración del Router MEDELLIN3

```
Router(config)#hostname MEDELLIN3 MEDELLIN3(config)#no ip
domain-lookup MEDELLIN3(config)#enable secret class
MEDELLIN3(config)#line console 0 MEDELLIN3(config-line)#password
cisco MEDELLIN3(config-line)#login MEDELLIN3(config-line)#line vty 0
4 MEDELLIN3(config-line)#password cisco MEDELLIN3(config-
line)#login MEDELLIN3(config-line)#exit MEDELLIN3(config)#service
password-encryption
```

```
MEDELLIN3(config)#banner motd "Prohibido el acceso no autorizado"
```

```
MEDELLIN3(config)#interface s0/0/0 MEDELLIN3(config-if)#description
connection medellin-2
```

```
MEDELLIN3(config-if)#ip address 172.29.6.6 255.255.255.252
MEDELLIN3(config-if)#no shutdown
```

```
MEDELLIN3(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
MEDELLIN3(config)#interface g0/1
```

```
MEDELLIN3(config-if)#description connection medellin3_Pc-A
MEDELLIN3(config-if)#ip address 172.29.4.129 255.255.255.128
```

```
MEDELLIN3(config-if)#no shutdown MEDELLIN3(config-if)#
```

```
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1,
changed
```

```
state to up MEDELLIN3(config-if)#exit
```

```
MEDELLIN3(config)#interface s0/0/1
```

```
MEDELLIN3(config-if)#description connection medellin-3_medellin- 1
```

```
MEDELLIN3(config-if)#ip address 172.29.6.10 255.255.255.252
MEDELLIN3(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
MEDELLIN3(config)#interface s0/1/0
```

```
MEDELLIN3(config-if)#description connection medellin-3_medellin- 1
```

```
MEDELLIN3(config-if)#ip address 172.29.6.14 255.255.255.252
MEDELLIN3(config-if)#no shutdown
```

MEDELLIN3(config-if)#

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

Configuración del Router BOGOTA1

```
Router(config)#hostname BOGOTA1 BOGOTA1(config)#no ipdomain-lookup BOGOTA1(config)#enable secret class BOGOTA1(config)#line console 0 BOGOTA1(config-line)#password cisco BOGOTA1(config-line)#login BOGOTA1(config-line)#line vty 0 4 BOGOTA1(config-line)#password cisco BOGOTA1(config-line)#login BOGOTA1(config-line)#exit
```

```
BOGOTA1(config)#service password-encryption
```

```
BOGOTA1 (config)#banner motd "Prohibido el acceso no autorizado" BOGOTA1(config)#interface s0/1/1
```

```
BOGOTA1(config-if)#description connection bogota-1_bogota-3 BOGOTA1(config-if)#ip address 172.29.3.1 255.255.255.252
```

```
BOGOTA1(config-if)#clock rate 128000
```

```
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down BOGOTA1(config)#interface s0/1/0
```

```
BOGOTA1(config-if)#description connection bogota-1_bogota-3 BOGOTA1(config-if)#ip address 172.29.3.5 255.255.255.252
```

```
BOGOTA1(config-if)#clock rate 128000 BOGOTA1(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down BOGOTA1(config)#interface s0/0/1
```

```
BOGOTA1(config-if)#description connection bogota-1_bogota-2 BOGOTA1(config-if)#ip address 172.29.3.9 255.255.255.252
```

```
BOGOTA1(config-if)#clock rate 128000 BOGOTA1(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down BOGOTA1(config)#interface s0/0/0
```

```
BOGOTA1(config-if)#description connection BOGOTA1_ISP BOGOTA1(config-if)#ip address 209.17.220.6 255.255.255.252 BOGOTA1(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
BOGOTA1(config-if)#end
```

## Configuración del Router BOGOTA2

```
Router(config)#hostname BOGOTA2 BOGOTA2(config)#no ipdomain-
lookup BOGOTA2(config)#enable secret class BOGOTA2(config)#line
console 0 BOGOTA2(config-line)#password cisco BOGOTA2(config-
line)#login BOGOTA2(config-line)#line vty 0 4 BOGOTA2(config-
line)#password cisco BOGOTA2(config-line)#login BOGOTA2(config-
line)#exit
```

```
BOGOTA2(config)#service password-encryption
BOGOTA2(config)#banner motd "Prohibido el acceso no autorizado"
BOGOTA2(config)#interface s0/0/1
```

```
BOGOTA2(config-if)#description connection bogota-2_bogota-1
BOGOTA2(config-if)#ip address 172.29.3.10 255.255.255.252
BOGOTA2(config-if)#no shutdown
```

```
BOGOTA2(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
BOGOTA3(config-if)#
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1,
changed state to up
```

```
BOGOTA2(config-if)# BOGOTA2(config)#interface s0/1/0
```

```
BOGOTA2(config-if)#description connection bogota-2_bogota-3
BOGOTA2(config-if)#ip address 172.29.3.13 255.255.255.252
```

```
BOGOTA2(config-if)#clock rate 128000
```

```
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
BOGOTA2(config-if)#
```

```
BOGOTA2(config)#interface g0/1
```

```
BOGOTA2(config-if)#description connection BOGOTA2_PC-C
BOGOTA2(config-if)#ip address 172.29.1.1 255.255.255.0
```

## Configuración del Router BOGOTA3

```
Router(config)#hostname BOGOTA3 BOGOTA3(config)#no ipdomain-lookup BOGOTA3(config)#enable secret class BOGOTA3(config)#line console 0 BOGOTA3(config-line)#password cisco BOGOTA3(config-line)#login BOGOTA3(config-line)#line vty 0 4 BOGOTA3(config-line)#password cisco BOGOTA3(config-line)#login BOGOTA3(config-line)#exit
```

```
BOGOTA3(config)#service password-encryption  
BOGOTA3(config)#banner motd "Prohibido el acceso no autorizado"  
BOGOTA3(config)#interface s0/0/1
```

```
BOGOTA3(config-if)#description connection bogota-3_bogota-2  
BOGOTA3(config-if)#ip address 172.29.3.14 255.255.255.252  
BOGOTA3(config-if)#no shutdown
```

```
BOGOTA3(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up  
BOGOTA3(config)#interface s0/0/0
```

```
BOGOTA3(config-if)#description connection bogota-3_bogota- 1_s0/1/0
```

```
BOGOTA3(config-if)#ip address 172.29.3.6 255.255.255.252  
BOGOTA3(config-if)#no shutdown
```

```
BOGOTA3(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up  
BOGOTA3(config)#interface s0/1/0
```

```
BOGOTA3(config-if)#description connection bogota-3_bogota- 1_s0/1/1
```

```
BOGOTA3(config-if)#ip address 172.29.3.2 255.255.255.252  
BOGOTA3(config-if)#no shutdown
```

```
BOGOTA3(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up  
BOGOTA3(config)#interface g0/1
```

```
BOGOTA3(config-if)#description connection BOGOTA3_Pc-B  
BOGOTA3(config-if)#ip address 172.29.0.1 255.255.255.0
```

## Configuración del Router ISP

```
ISP(config)#interface s0/0/0
```

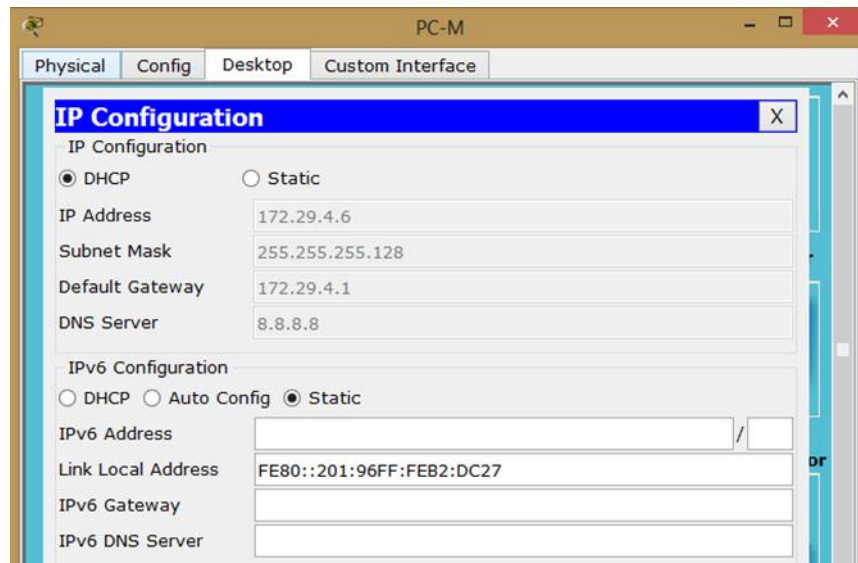
```
ISP(config-if)#description connection ISP_Medellin1 ISP(config-if)#ip address 209.17.220.1 255.255.255.252
```

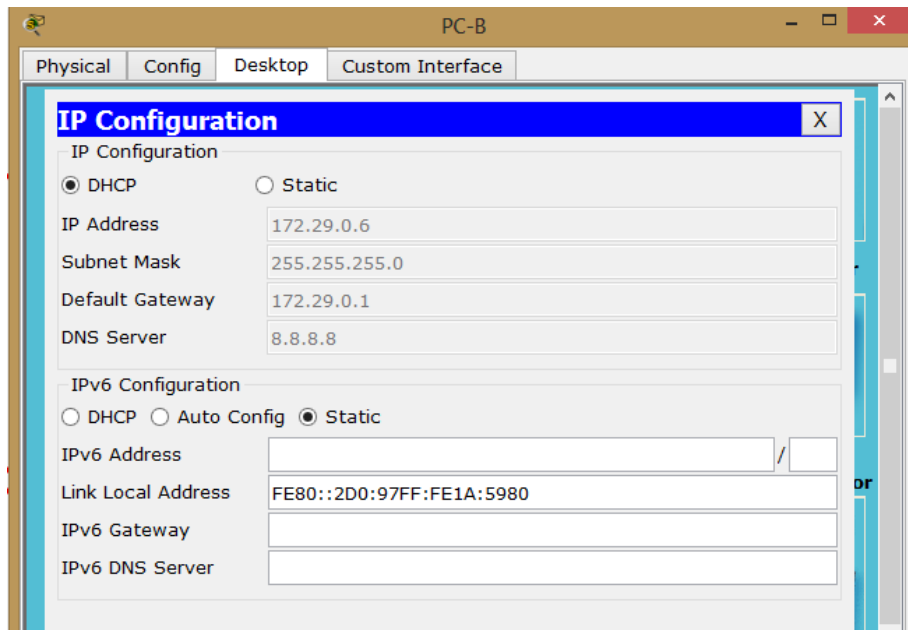
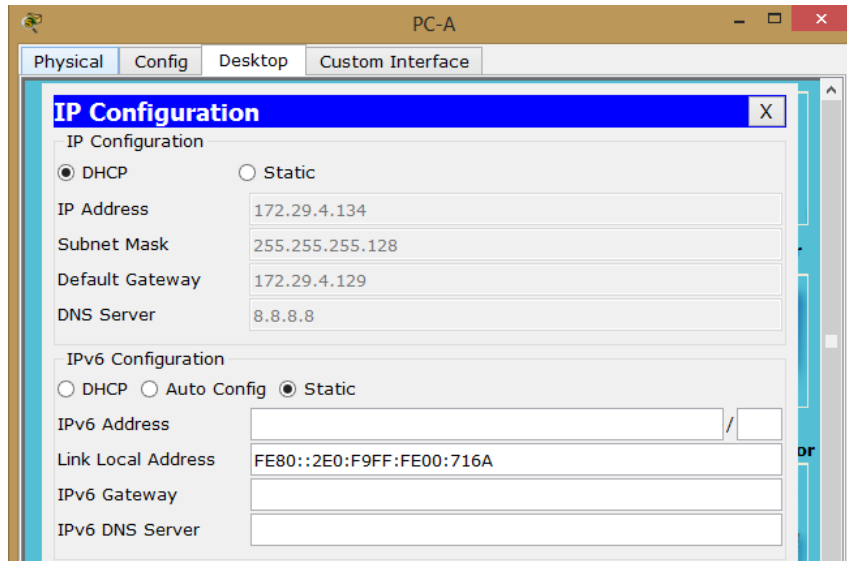
```
ISP(config-if)#clock rate 128000 ISP(config-if)#no shutdown  
ISP(config)#interface s0/0/1
```

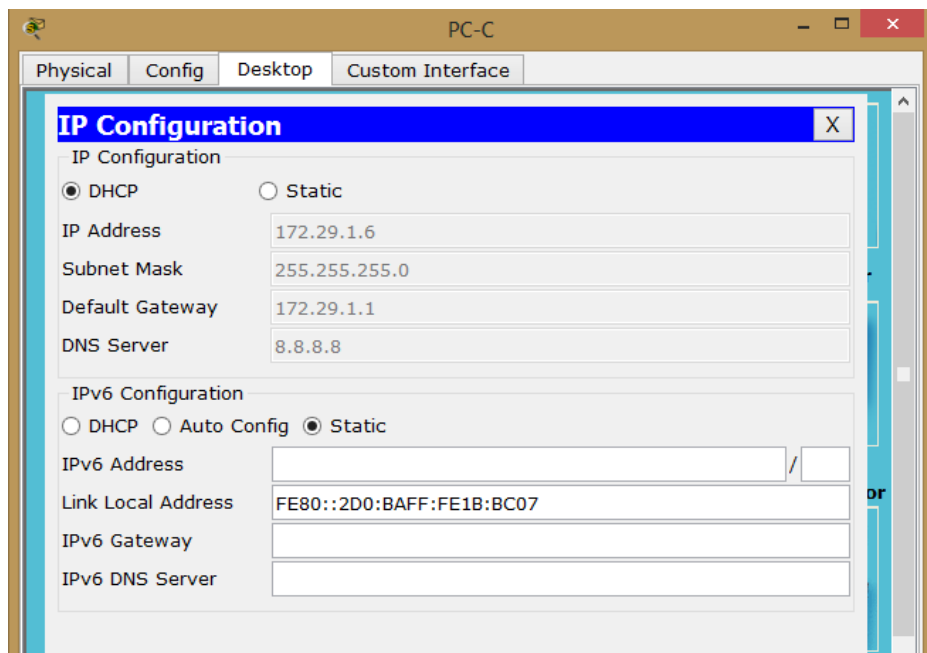
```
ISP(config-if)#description connection ISP_BOGOTA1 ISP(config-if)#ip address 209.17.220.5 255.255.255.252
```

```
ISP(config-if)#clock rate 128000 ISP(config-if)#no shutdown
```

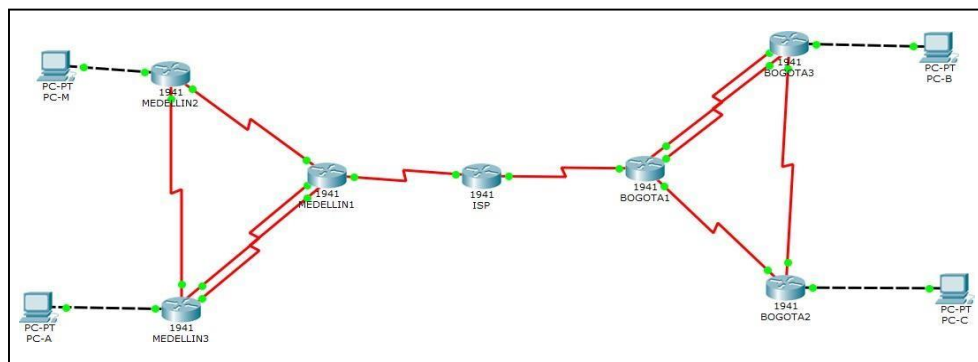
## Configuración de los host de la red







Conexión física de los equipos con la topología de red





## CONFIGURAR LA TOPOLOGÍA DE RED, DE ACUERDO CON LAS SIGUIENTES ESPECIFICACIONES.

### Parte 1: Configuración del enrutamiento

Configurar el enrutamiento en la red usando el protocolo RIP versión 2, declare la red principal, desactive la sumarización automática.

```
MEDELLIN1(config)#router rip
MEDELLIN1(config-router)#version 2
MEDELLIN1(config-router)#no auto-summary
MEDELLIN1(config-router)#network 172.29.6.0
MEDELLIN1(config-router)#network 172.29.6.8
MEDELLIN1(config-router)#network 172.29.6.12
MEDELLIN1(config-router)#passive-interface s0/1/0
```

```
MEDELLIN2(config)#router rip
MEDELLIN2(config-router)#version 2
MEDELLIN2(config-router)#no auto-summary
MEDELLIN2(config-router)#network 172.29.4.0
MEDELLIN2(config-router)#network 172.29.6.0
MEDELLIN2(config-router)#network 172.29.6.4
MEDELLIN2(config-router)#passive-interface g0/1
```

```
MEDELLIN3(config)#router rip
MEDELLIN3(config-router)#version 2
MEDELLIN3(config-router)#no auto-summary
MEDELLIN3(config-router)#network 172.29.4.128
MEDELLIN3(config-router)#network 172.29.6.4
```

```
MEDELLIN3(config-router)#network 172.29.6.8
MEDELLIN3(config-router)#network 172.29.6.12
MEDELLIN3(config-router)#passive-interface g0/1
```

Configuracion de protocolo RIPv2 en BOGOTA

```
BOGOTA1(config)#router rip
BOGOTA1(config-router)#version 2
BOGOTA1(config-router)#no auto-summary
BOGOTA1(config-router)#network 172.29.3.0
BOGOTA1(config-router)#network 172.29.3.4
BOGOTA1(config-router)#network 172.29.3.8
BOGOTA1(config-router)#passive-interface s0/0/0
```

```
BOGOTA2(config)#router rip
BOGOTA2(config-router)#version 2
BOGOTA2(config-router)#no auto-summary
BOGOTA2(config-router)#network 172.29.1.0
BOGOTA2(config-router)#network 172.29.3.8
BOGOTA2(config-router)#network 172.29.3.12
BOGOTA2(config-router)#passive-interface g0/1
```

```
BOGOTA3(config)#router rip
BOGOTA3(config-router)#version 2
BOGOTA3(config-router)#no auto-summary
BOGOTA3(config-router)#network 172.29.0.0
BOGOTA3(config-router)#network 172.29.3.0
```

```
BOGOTA3(config-router)#network 172.29.3.4
```

```
BOGOTA3(config-router)#network 172.29.3.12
```

```
BOGOTA3(config-router)#passive-interface g0/1
```

Los routers Bogota1 y Medellín deberán añadir a su configuración de enrutamiento una ruta por defecto hacia el ISP y, a su vez, redistribuirla dentro de las publicaciones de RIP.

Ruta estatica router MEDELLIN1 a ISP

```
MEDELLIN1(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.1
```

```
MEDELLIN1(config)#router rip
```

```
MEDELLIN1(config-router)#default-information originate
```

Ruta estatica router BOGOTA1 a ISP

```
BOGOTA1(config)# ip route 0.0.0.0 0.0.0.0 209.17.220.5
```

```
BOGOTA1(config)#router rip BOGOTA1(config)# default-  
information originate
```

El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se suman las subredes de cada una a /22.

Ruta estática al router MEDELLIN1

```
ISP(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2
```

Ruta estática al router BOGOTA1

```
ISP(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.6
```

Parte 2: Tabla de Enrutamiento.

Verificar la tabla de enrutamiento en cada uno de los routers para comprobar las redes y sus rutas.

Verificar el balanceo de carga que presentan los routers.

Obsérvese en los routers Bogotá1 y Medellín1 cierta similitud por su ubicación, por tener dos enlaces de conexión hacia otro router y por la ruta por defecto que manejan.

Para verificar los pasos anteriores ejecutamos el comando #show ip route en cada router

```

MEDELLIN1
Physical Config CLI
IOS Command Line Interface
MEDELLIN1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is 209.17.220.1 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
R 172.29.4.0/25 [120/1] via 172.29.6.2, 00:00:03, Serial0/0/0
R 172.29.4.128/25 [120/1] via 172.29.6.14, 00:00:02, Serial0/1/1
[120/1] via 172.29.6.10, 00:00:02, Serial0/0/1
C 172.29.6.0/30 is directly connected, Serial0/0/0
L 172.29.6.1/32 is directly connected, Serial0/0/0
R 172.29.6.4/30 [120/1] via 172.29.6.2, 00:00:03, Serial0/0/0
[120/1] via 172.29.6.14, 00:00:02, Serial0/1/1
[120/1] via 172.29.6.10, 00:00:02, Serial0/0/1
C 172.29.6.8/30 is directly connected, Serial0/0/1
L 172.29.6.9/32 is directly connected, Serial0/0/1
C 172.29.6.12/30 is directly connected, Serial0/1/1
L 172.29.6.13/32 is directly connected, Serial0/1/1
209.17.220.0/24 is variably subnetted, 3 subnets, 2 masks
C 209.17.220.0/30 is directly connected, Serial0/1/0
C 209.17.220.1/32 is directly connected, Serial0/1/0
L 209.17.220.2/32 is directly connected, Serial0/1/0
S* 0.0.0.0/0 [1/0] via 209.17.220.1

```

```

BOGOTA1
Physical Config CLI
IOS Command Line Interface
BOGOTA1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is 209.17.220.5 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
R 172.29.0.0/24 [120/1] via 172.29.3.6, 00:00:09, Serial0/1/0
[120/1] via 172.29.3.2, 00:00:09, Serial0/1/1
R 172.29.1.0/24 [120/1] via 172.29.3.10, 00:00:03, Serial0/0/1
C 172.29.3.0/30 is directly connected, Serial0/1/1
L 172.29.3.1/32 is directly connected, Serial0/1/1
C 172.29.3.4/30 is directly connected, Serial0/1/0
L 172.29.3.5/32 is directly connected, Serial0/1/0
C 172.29.3.8/30 is directly connected, Serial0/0/1
L 172.29.3.9/32 is directly connected, Serial0/0/1
R 172.29.3.12/30 [120/1] via 172.29.3.10, 00:00:03, Serial0/0/1
[120/1] via 172.29.3.6, 00:00:09, Serial0/1/0
[120/1] via 172.29.3.2, 00:00:09, Serial0/1/1
209.17.220.0/24 is variably subnetted, 3 subnets, 2 masks
C 209.17.220.4/30 is directly connected, Serial0/0/0
C 209.17.220.5/32 is directly connected, Serial0/0/0
L 209.17.220.6/32 is directly connected, Serial0/0/0
S* 0.0.0.0/0 [1/0] via 209.17.220.5
BOGOTA1#

```

Los routers Medellín2 y Bogotá2 también presentan redes conectadas directamente y recibidas mediante RIP.

```

MEDELLIN2
Physical Config CLI
IOS Command Line Interface
MEDELLIN2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is 172.29.6.1 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
C    172.29.4.0/25 is directly connected, GigabitEthernet0/1
L    172.29.4.1/32 is directly connected, GigabitEthernet0/1
R    172.29.4.128/25 [120/1] via 172.29.6.6, 00:00:12, Serial0/0/1
C    172.29.6.0/30 is directly connected, Serial0/0/0
L    172.29.6.2/32 is directly connected, Serial0/0/0
C    172.29.6.4/30 is directly connected, Serial0/0/1
L    172.29.6.5/32 is directly connected, Serial0/0/1
R    172.29.6.8/30 [120/1] via 172.29.6.1, 00:00:20, Serial0/0/0
    [120/1] via 172.29.6.6, 00:00:12, Serial0/0/1
R    172.29.6.12/30 [120/1] via 172.29.6.1, 00:00:20, Serial0/0/0
    [120/1] via 172.29.6.6, 00:00:12, Serial0/0/1
R*   0.0.0.0/0 [120/1] via 172.29.6.1, 00:00:20, Serial0/0/0

```

```

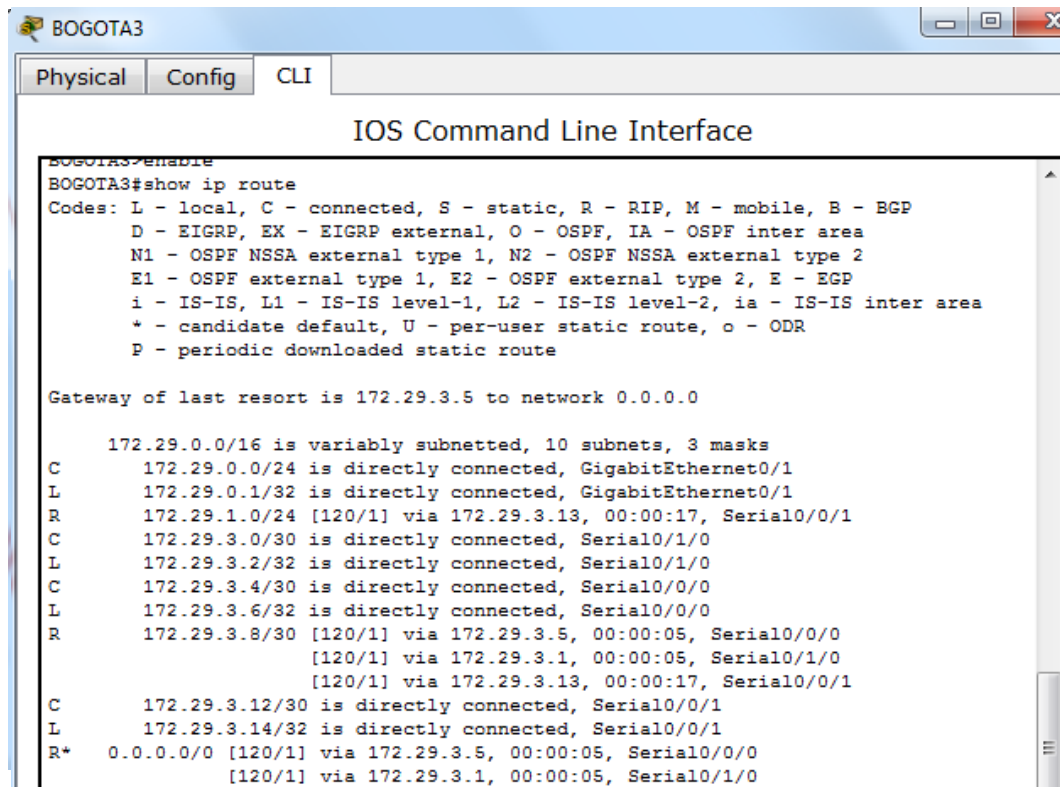
BOGOTA2
Physical Config CLI
IOS Command Line Interface
BOGOTA2>enable
BOGOTA2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is 172.29.3.9 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
R    172.29.0.0/24 [120/1] via 172.29.3.14, 00:00:12, Serial0/1/0
C    172.29.1.0/24 is directly connected, GigabitEthernet0/1
L    172.29.1.1/32 is directly connected, GigabitEthernet0/1
R    172.29.3.0/30 [120/1] via 172.29.3.9, 00:00:26, Serial0/0/1
    [120/1] via 172.29.3.14, 00:00:12, Serial0/1/0
R    172.29.3.4/30 [120/1] via 172.29.3.9, 00:00:26, Serial0/0/1
    [120/1] via 172.29.3.14, 00:00:12, Serial0/1/0
C    172.29.3.8/30 is directly connected, Serial0/0/1
L    172.29.3.10/32 is directly connected, Serial0/0/1
C    172.29.3.12/30 is directly connected, Serial0/1/0
L    172.29.3.13/32 is directly connected, Serial0/1/0
R*   0.0.0.0/0 [120/1] via 172.29.3.9, 00:00:26, Serial0/0/1

```

Las tablas de los routers restantes deben permitir visualizar rutas redundantes para el caso de la ruta por defecto.

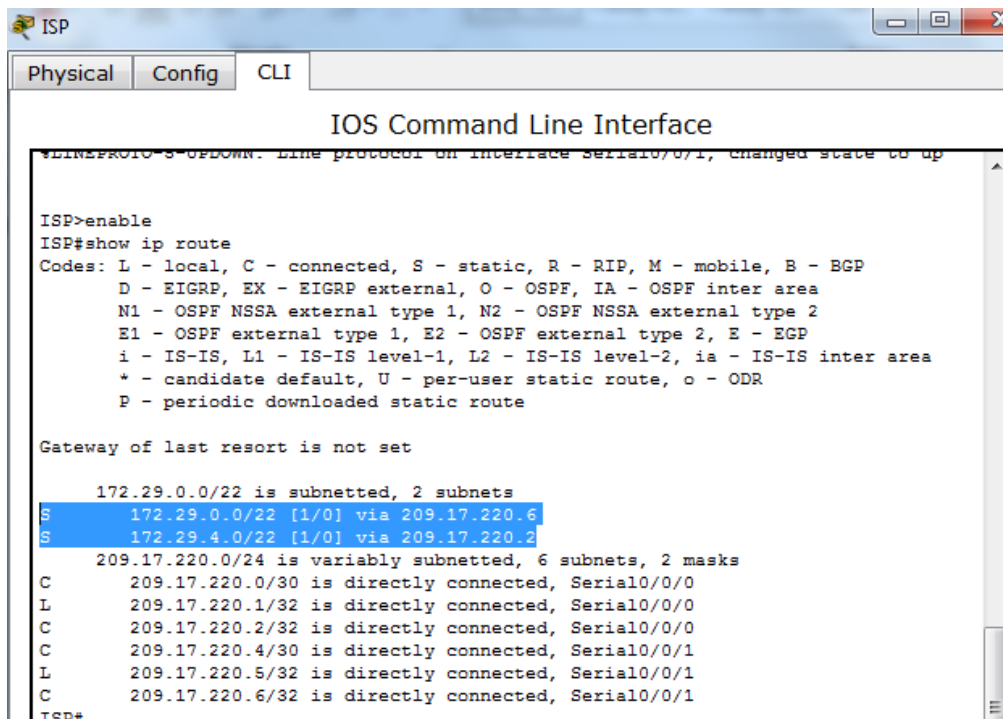


```
BOGOTA3
Physical Config CLI
IOS Command Line Interface
BOGOTA3>enable
BOGOTA3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is 172.29.3.5 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 10 subnets, 3 masks
C 172.29.0.0/24 is directly connected, GigabitEthernet0/1
L 172.29.0.1/32 is directly connected, GigabitEthernet0/1
R 172.29.1.0/24 [120/1] via 172.29.3.13, 00:00:17, Serial0/0/1
C 172.29.3.0/30 is directly connected, Serial0/1/0
L 172.29.3.2/32 is directly connected, Serial0/1/0
C 172.29.3.4/30 is directly connected, Serial0/0/0
L 172.29.3.6/32 is directly connected, Serial0/0/0
R 172.29.3.8/30 [120/1] via 172.29.3.5, 00:00:05, Serial0/0/0
[120/1] via 172.29.3.1, 00:00:05, Serial0/1/0
[120/1] via 172.29.3.13, 00:00:17, Serial0/0/1
C 172.29.3.12/30 is directly connected, Serial0/0/1
L 172.29.3.14/32 is directly connected, Serial0/0/1
R* 0.0.0.0/0 [120/1] via 172.29.3.5, 00:00:05, Serial0/0/0
[120/1] via 172.29.3.1, 00:00:05, Serial0/1/0
```

El router ISP solo debe indicar sus rutas estáticas adicionales a las directamente conectadas.



```
ISP
Physical Config CLI
IOS Command Line Interface
ISP#enable
ISP#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

172.29.0.0/22 is subnetted, 2 subnets
S 172.29.0.0/22 [1/0] via 209.17.220.6
S 172.29.4.0/22 [1/0] via 209.17.220.2
209.17.220.0/24 is variably subnetted, 6 subnets, 2 masks
C 209.17.220.0/30 is directly connected, Serial0/0/0
L 209.17.220.1/32 is directly connected, Serial0/0/0
C 209.17.220.2/32 is directly connected, Serial0/0/0
C 209.17.220.4/30 is directly connected, Serial0/0/1
L 209.17.220.5/32 is directly connected, Serial0/0/1
C 209.17.220.6/32 is directly connected, Serial0/0/1
ISP#
```

### Parte 3: Deshabilitar la propagación del protocolo RIP.

a. Para no propagar las publicaciones por interfaces que no lo requieran se debe deshabilitar la propagación del protocolo RIP, en la siguiente tabla se indican las interfaces de cada router que no necesitan desactivación.

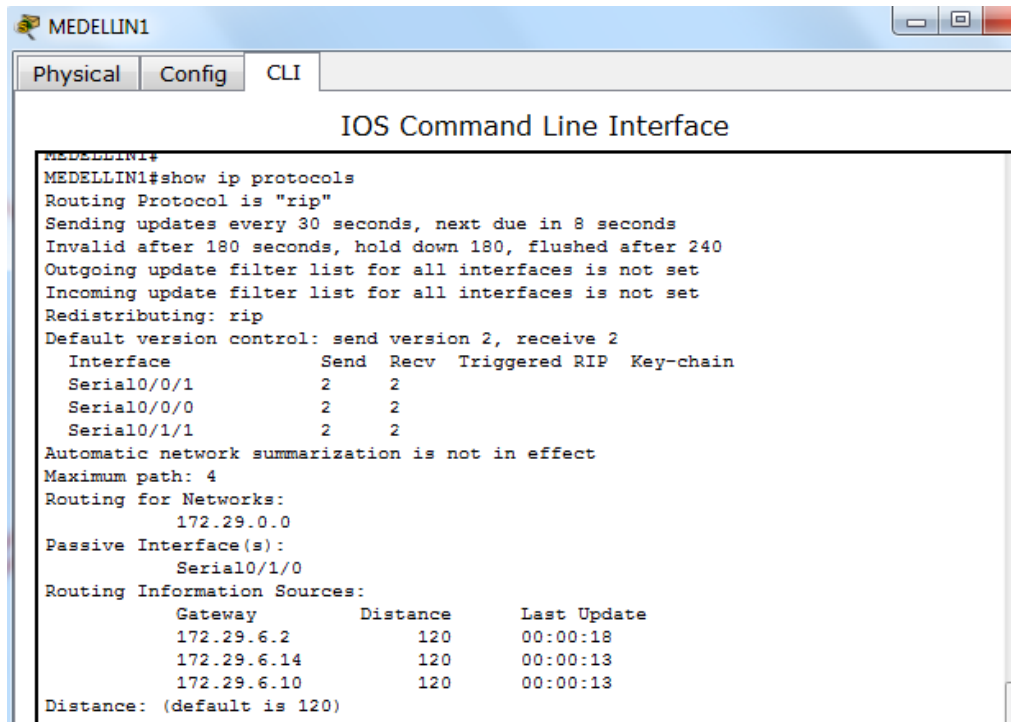
ROUTER	INTERFAZ
Bogota1	SERIAL0/0/1; SERIAL0/1/0; SERIAL0/1/1
Bogota2	SERIAL0/0/0; SERIAL0/0/1
Bogota3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
Medellín1	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/1
Medellín2	SERIAL0/0/0; SERIAL0/0/1
Medellín3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
ISP	No lo require

### Parte 4: Verificación del protocolo RIP

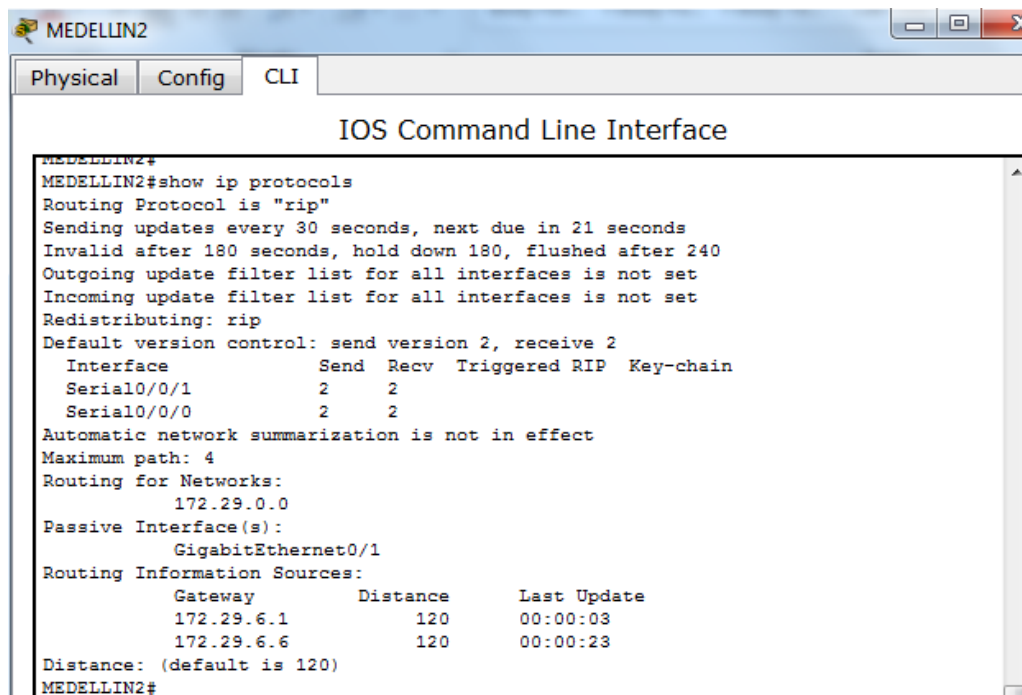
Verificar y documentar las opciones de enrutamiento configuradas en los routers, como el passive interface para la conexión hacia el ISP, la versión de RIP y las interfaces que participan de la publicación entre otros datos.



Ejecutamos `#show ip protocols` en cada router



```
MEDELLIN1#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 8 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send Recv Triggered RIP Key-chain
Serial0/0/1          2     2
Serial0/0/0          2     2
Serial0/1/1          2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  Serial0/1/0
Routing Information Sources:
  Gateway            Distance      Last Update
172.29.6.2           120           00:00:18
172.29.6.14          120           00:00:13
172.29.6.10          120           00:00:13
Distance: (default is 120)
```



```
MEDELLIN2#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 21 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send Recv Triggered RIP Key-chain
Serial0/0/1          2     2
Serial0/0/0          2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/1
Routing Information Sources:
  Gateway            Distance      Last Update
172.29.6.1           120           00:00:03
172.29.6.6           120           00:00:23
Distance: (default is 120)
MEDELLIN2#
```

MEDELLIN3

Physical Config CLI

### IOS Command Line Interface

```

MEDELLIN3#
MEDELLIN3#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 16 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send Recv Triggered RIP Key-chain
  Serial0/1/0         2    2
  Serial0/0/1         2    2
  Serial0/0/0         2    2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/1
Routing Information Sources:
  Gateway            Distance    Last Update
  172.29.6.13        120        00:00:24
  172.29.6.9         120        00:00:24
  172.29.6.5         120        00:00:26
Distance: (default is 120)
MEDELLIN3#

```

BOGOTA1

Physical Config CLI

### IOS Command Line Interface

```

BOGOTA1#
BOGOTA1#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 27 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send Recv Triggered RIP Key-chain
  Serial0/1/1         2    2
  Serial0/0/1         2    2
  Serial0/1/0         2    2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  Serial0/0/0
Routing Information Sources:
  Gateway            Distance    Last Update
  172.29.3.6         120        00:00:22
  172.29.3.2         120        00:00:22
  172.29.3.10        120        00:00:14
Distance: (default is 120)
BOGOTA1#

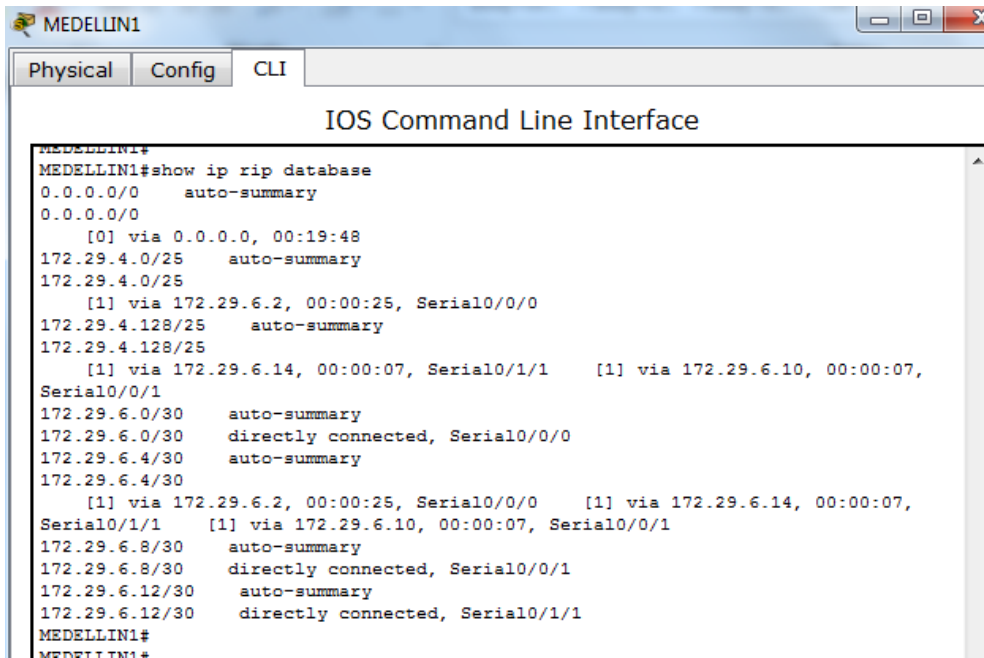
```

```
BOGOTA2#
BOGOTA2#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 1 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send  Recv  Triggered RIP  Key-chain
  Serial10/1/0       2     2
  Serial10/0/1       2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/1
Routing Information Sources:
  Gateway            Distance    Last Update
  172.29.3.9         120         00:00:11
  172.29.3.14        120         00:00:06
Distance: (default is 120)
BOGOTA2#
```

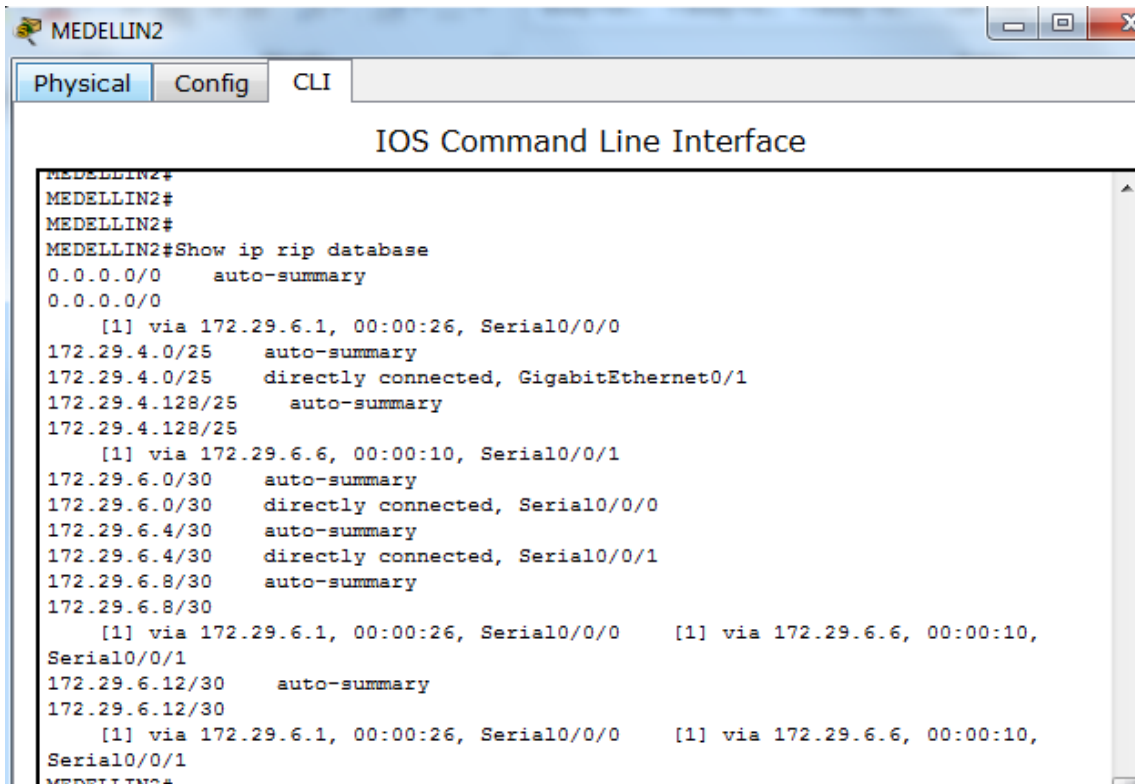
```
BOGOTA3#
BOGOTA3#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 26 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send  Recv  Triggered RIP  Key-chain
  Serial10/0/0       2     2
  Serial10/1/0       2     2
  Serial10/0/1       2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/1
Routing Information Sources:
  Gateway            Distance    Last Update
  172.29.3.5         120         00:00:06
  172.29.3.1         120         00:00:06
  172.29.3.13        120         00:00:23
Distance: (default is 120)
BOGOTA3#
```

Verificar y documentar la base de datos de RIP de cada router, donde se informa de manera detallada de todas las rutas hacia cada red.

Ejecutamos #show ip rip database



```
MEDELLIN1#show ip rip database
0.0.0.0/0    auto-summary
0.0.0.0/0
    [0] via 0.0.0.0, 00:19:48
172.29.4.0/25 auto-summary
172.29.4.0/25
    [1] via 172.29.6.2, 00:00:25, Serial0/0/0
172.29.4.128/25 auto-summary
172.29.4.128/25
    [1] via 172.29.6.14, 00:00:07, Serial0/1/1    [1] via 172.29.6.10, 00:00:07,
Serial0/0/1
172.29.6.0/30 auto-summary
172.29.6.0/30 directly connected, Serial0/0/0
172.29.6.4/30 auto-summary
172.29.6.4/30
    [1] via 172.29.6.2, 00:00:25, Serial0/0/0    [1] via 172.29.6.14, 00:00:07,
Serial0/1/1    [1] via 172.29.6.10, 00:00:07, Serial0/0/1
172.29.6.8/30 auto-summary
172.29.6.8/30 directly connected, Serial0/0/1
172.29.6.12/30 auto-summary
172.29.6.12/30 directly connected, Serial0/1/1
MEDELLIN1#
```



```
MEDELLIN2#Show ip rip database
0.0.0.0/0    auto-summary
0.0.0.0/0
    [1] via 172.29.6.1, 00:00:26, Serial0/0/0
172.29.4.0/25 auto-summary
172.29.4.0/25 directly connected, GigabitEthernet0/1
172.29.4.128/25 auto-summary
172.29.4.128/25
    [1] via 172.29.6.6, 00:00:10, Serial0/0/1
172.29.6.0/30 auto-summary
172.29.6.0/30 directly connected, Serial0/0/0
172.29.6.4/30 auto-summary
172.29.6.4/30 directly connected, Serial0/0/1
172.29.6.8/30 auto-summary
172.29.6.8/30
    [1] via 172.29.6.1, 00:00:26, Serial0/0/0    [1] via 172.29.6.6, 00:00:10,
Serial0/0/1
172.29.6.12/30 auto-summary
172.29.6.12/30
    [1] via 172.29.6.1, 00:00:26, Serial0/0/0    [1] via 172.29.6.6, 00:00:10,
Serial0/0/1
MEDELLIN2#
```

```
MEDELLIN3
Physical Config CLI
IOS Command Line Interface

% Invalid input detected at '^' marker.

MEDELLIN3#show ip rip database
0.0.0.0/0 auto-summary
0.0.0.0/0
    [1] via 172.29.6.13, 00:00:16, Serial0/1/0    [1] via 172.29.6.9, 00:00:16,
Serial0/0/1
172.29.4.0/25 auto-summary
172.29.4.0/25
    [1] via 172.29.6.5, 00:00:19, Serial0/0/0
172.29.4.128/25 auto-summary
172.29.4.128/25 directly connected, GigabitEthernet0/1
172.29.6.0/30 auto-summary
172.29.6.0/30
    [1] via 172.29.6.13, 00:00:16, Serial0/1/0    [1] via 172.29.6.9, 00:00:16,
Serial0/0/1    [1] via 172.29.6.5, 00:00:19, Serial0/0/0
172.29.6.4/30 auto-summary
172.29.6.4/30 directly connected, Serial0/0/0
172.29.6.8/30 auto-summary
172.29.6.8/30 directly connected, Serial0/0/1
172.29.6.12/30 auto-summary
172.29.6.12/30 directly connected, Serial0/1/0
```

```
BOGOTA1
Physical Config CLI
IOS Command Line Interface

BOGOTA1#
BOGOTA1#Show ip rip database
0.0.0.0/0 auto-summary
0.0.0.0/0
    [0] via 0.0.0.0, 00:22:24
172.29.0.0/24 auto-summary
172.29.0.0/24
    [1] via 172.29.3.6, 00:00:17, Serial0/1/0    [1] via 172.29.3.2, 00:00:17,
Serial0/1/1
172.29.1.0/24 auto-summary
172.29.1.0/24
    [1] via 172.29.3.10, 00:00:18, Serial0/0/1
172.29.3.0/30 auto-summary
172.29.3.0/30 directly connected, Serial0/1/1
172.29.3.4/30 auto-summary
172.29.3.4/30 directly connected, Serial0/1/0
172.29.3.8/30 auto-summary
172.29.3.8/30 directly connected, Serial0/0/1
172.29.3.12/30 auto-summary
172.29.3.12/30
    [1] via 172.29.3.10, 00:00:18, Serial0/0/1    [1] via 172.29.3.6, 00:00:17,
Serial0/1/0    [1] via 172.29.3.2, 00:00:17, Serial0/1/1
BOGOTA1#
```

```
BOGOTA2#show ip rip database
0.0.0.0/0    auto-summary
0.0.0.0/0
    [1] via 172.29.3.9, 00:00:04, Serial0/0/1
172.29.0.0/24 auto-summary
172.29.0.0/24
    [1] via 172.29.3.14, 00:00:26, Serial0/1/0
172.29.1.0/24 auto-summary
172.29.1.0/24 directly connected, GigabitEthernet0/1
172.29.3.0/30 auto-summary
172.29.3.0/30
    [1] via 172.29.3.9, 00:00:04, Serial0/0/1    [1] via 172.29.3.14, 00:00:26,
Serial0/1/0
172.29.3.4/30 auto-summary
172.29.3.4/30
    [1] via 172.29.3.9, 00:00:04, Serial0/0/1    [1] via 172.29.3.14, 00:00:26,
Serial0/1/0
172.29.3.8/30 auto-summary
172.29.3.8/30 directly connected, Serial0/0/1
172.29.3.12/30 auto-summary
172.29.3.12/30 directly connected, Serial0/1/0
BOGOTA2#
```

```
BOGOTA3#show ip rip database
0.0.0.0/0    auto-summary
0.0.0.0/0
    [1] via 172.29.3.5, 00:00:16, Serial0/0/0    [1] via 172.29.3.1, 00:00:16,
Serial0/1/0
172.29.0.0/24 auto-summary
172.29.0.0/24 directly connected, GigabitEthernet0/1
172.29.1.0/24 auto-summary
172.29.1.0/24
    [1] via 172.29.3.13, 00:00:10, Serial0/0/1
172.29.3.0/30 auto-summary
172.29.3.0/30 directly connected, Serial0/1/0
172.29.3.4/30 auto-summary
172.29.3.4/30 directly connected, Serial0/0/0
172.29.3.8/30 auto-summary
172.29.3.8/30
    [1] via 172.29.3.5, 00:00:16, Serial0/0/0    [1] via 172.29.3.1, 00:00:16,
Serial0/1/0    [1] via 172.29.3.13, 00:00:10, Serial0/0/1
172.29.3.12/30 auto-summary
172.29.3.12/30 directly connected, Serial0/0/1
BOGOTA3#
```

## Parte 5: Configurar encapsulamiento y autenticación PPP.

Según la topología se requiere que el enlace Medellín1 con ISP sea configurado con autenticación PAT.

### MEDELLIN1#config t

Enter configuration commands, one per line. End with CNTL/Z.

```
MEDELLIN1(config)#username ISP password cisco
```

```
MEDELLIN1(config)#interface s0/1/0
```

```
MEDELLIN1(config-if)#encapsulation ppp MEDELLIN1(config-if)#
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to down
```

```
MEDELLIN1(config-if)#ppp authentication pap
```

```
MEDELLIN1(config-if)#ppp pap sent-username MEDELLIN1 password cisco
```

```
MEDELLIN1(config-if)#
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
```

```
MEDELLIN1(config-if)#end
```

### ISP#config t

Enter configuration commands, one per line. End with CNTL/Z.

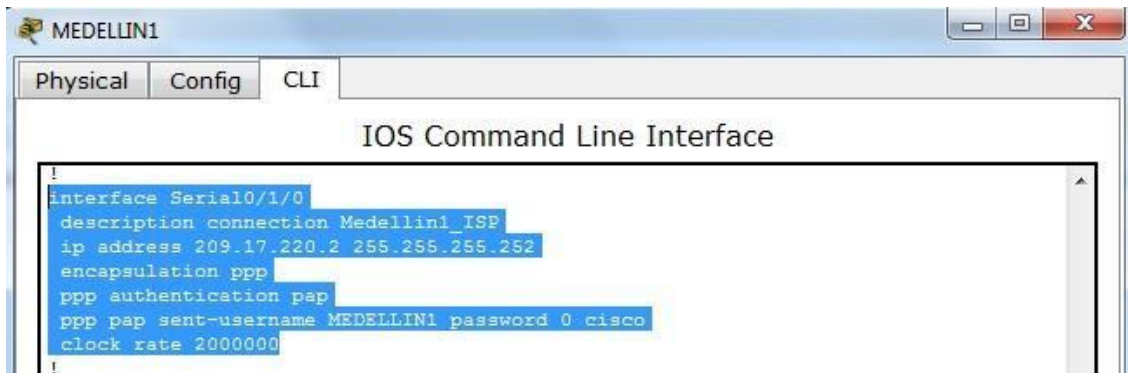
```
ISP(config)#username MEDELLIN1 password cisco ISP(config)#interface s0/0/0
```

```
ISP(config-if)#encapsulation ppp
```

```
ISP(config-if)#ppp authentication pap
```

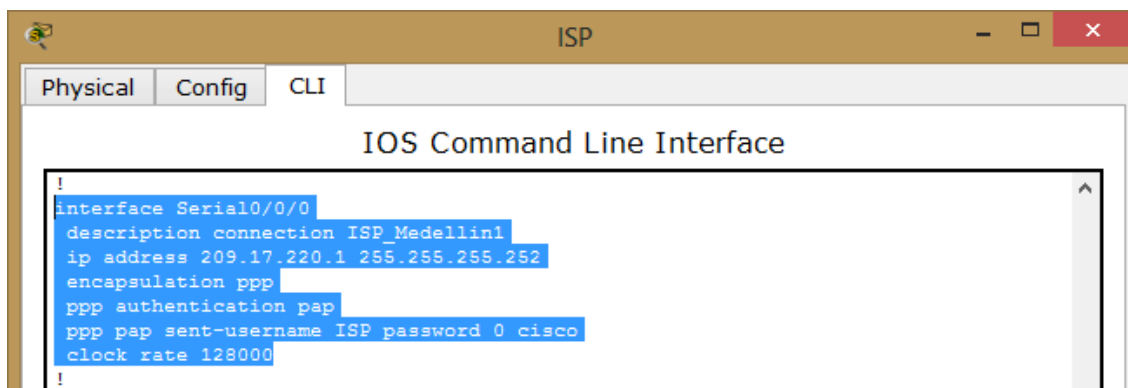
```
ISP(config-if)#ppp pap sent-username ISP password cisco ISP(config-if)#
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```



The screenshot shows a window titled 'MEDELLIN1' with tabs for 'Physical', 'Config', and 'CLI'. The main area is labeled 'IOS Command Line Interface' and contains the following configuration commands:

```
!
interface Serial0/1/0
description connection Medellin1_ISP
ip address 209.17.220.2 255.255.255.252
encapsulation ppp
ppp authentication pap
ppp pap sent-username MEDELLIN1 password 0 cisco
clock rate 2000000
!
```



The screenshot shows a window titled 'ISP' with tabs for 'Physical', 'Config', and 'CLI'. The main area is labeled 'IOS Command Line Interface' and contains the following configuration commands:

```
!
interface Serial0/0/0
description connection ISP_Medellin1
ip address 209.17.220.1 255.255.255.252
encapsulation ppp
ppp authentication pap
ppp pap sent-username ISP password 0 cisco
clock rate 128000
!
```

El enlace Bogotá1 con ISP se debe configurar con autenticación CHAT.  
BOGOTA1#config t

Enter configuration commands, one per line. End with CNTL/Z.

BOGOTA1(config)#username ISP password class

BOGOTA1(config)#interface s0/0/0

BOGOTA1(config-if)#encapsulation ppp BOGOTA1(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,  
changed state to down

BOGOTA1(config-if)#ppp authentication chap BOGOTA1(config-if)#

BOGOTA1(config-if)#



%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

ISP#config t

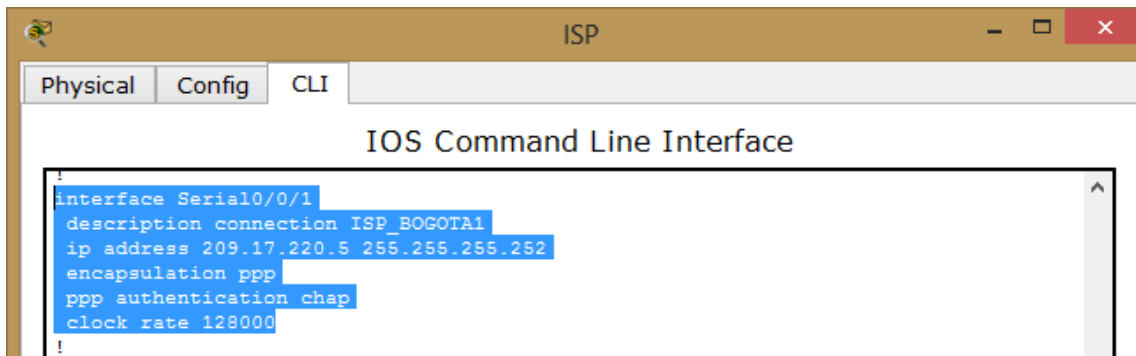
Enter configuration commands, one per line. End with CNTL/Z.

ISP(config)#username BOGOTA1 password class ISP(config)#interface s0/0/1

ISP(config-if)#encapsulation ppp ISP(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

ISP(config-if)#ppp authenticationchap ISP(config-if)#



```
ISP
Physical Config CLI
IOS Command Line Interface
1
interface Serial0/0/1
description connection ISP_BOGOTA1
ip address 209.17.220.5 255.255.255.252
encapsulation ppp
ppp authentication chap
clock rate 128000
!
```



```
BOGOTA1
Physical Config CLI
IOS Command Line Interface
1
interface Serial0/0/0
description connection BOGOTA1_ISP
ip address 209.17.220.6 255.255.255.252
encapsulation ppp
ppp authentication chap
ip nat outside
clock rate 2000000
!
```

## Parte 6: Configuración de PAT.

En la topología, si se activa NAT en cada equipo de salida (Bogotá1 y Medellín1), los routers internos de una ciudad no podrán llegar hasta los routers internos en el otro extremo, sólo existirá comunicación hasta los routers Bogotá1, ISP y Medellín1.

Después de verificar lo indicado en el paso anterior proceda a configurar el NAT en el router Medellín1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Medellín1, como diferente puerto.

```
MEDELLIN1#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
MEDELLIN1(config)#access-list 1 permit 172.29.4.0 0.0.3.255
```

```
MEDELLIN1(config)#ip nat inside source list 1 interface s0/1/0  
overload
```

```
MEDELLIN1(config)#interface s0/0/0 MEDELLIN1(config-if)#ip nat
```

```
inside MEDELLIN1(config-if)#interface s0/1/1 MEDELLIN1(config-
```

```
if)#ip nat inside MEDELLIN1(config-if)#interface s0/0/1
```

```
MEDELLIN1(config-if)#ip nat inside MEDELLIN1(config-if)#interface
```

```
s0/1/0 MEDELLIN1(config-if)#ip nat outside MEDELLIN1(config-
```

```
if)#exit MEDELLIN1(config)#exit
```

Ejecutamos #show ip nat statistics

```

MEDELLIN1>enable
Password:
MEDELLIN1#show ip nat statistics
Total translations: 4 (0 static, 4 dynamic, 4 extended)
Outside Interfaces: Serial0/1/0
Inside Interfaces: Serial0/0/0 , Serial0/0/1 , Serial0/1/1
Hits: 4 Misses: 4
Expired translations: 0
Dynamic mappings:

```

Ejecutamos #show ip nat translations

```

MEDELLIN1#show ip nat translations
Dynamic mappings:
MEDELLIN1#show ip nat translations
Pro Inside global Inside local Outside local Outside global
icmp 209.17.220.2:17 172.29.4.6:17 209.17.220.1:17 209.17.220.1:17
icmp 209.17.220.2:18 172.29.4.6:18 209.17.220.1:18 209.17.220.1:18
icmp 209.17.220.2:19 172.29.4.6:19 209.17.220.1:19 209.17.220.1:19
icmp 209.17.220.2:20 172.29.4.6:20 209.17.220.1:20 209.17.220.1:20
MEDELLIN1#
MEDELLIN1#
MEDELLIN1#

```

Proceda a configurar el NAT en el router Bogotá1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Bogotá1, como diferente puerto.

BOGOTA1#config t

Enter configuration commands, one per line. End with CNTL/Z.

BOGOTA1(config)#access-list 1 permit 172.29.0.0 0.0.3.255

BOGOTA1(config)#ip nat inside source list 1 interface s0/0/0 overload

BOGOTA1(config)#interface s0/0/1

BOGOTA1(config-if)#ip nat inside BOGOTA1(config-if)#interface s0/1/1

BOGOTA1(config-if)#ip nat inside BOGOTA1(config-if)#interface s0/1/0

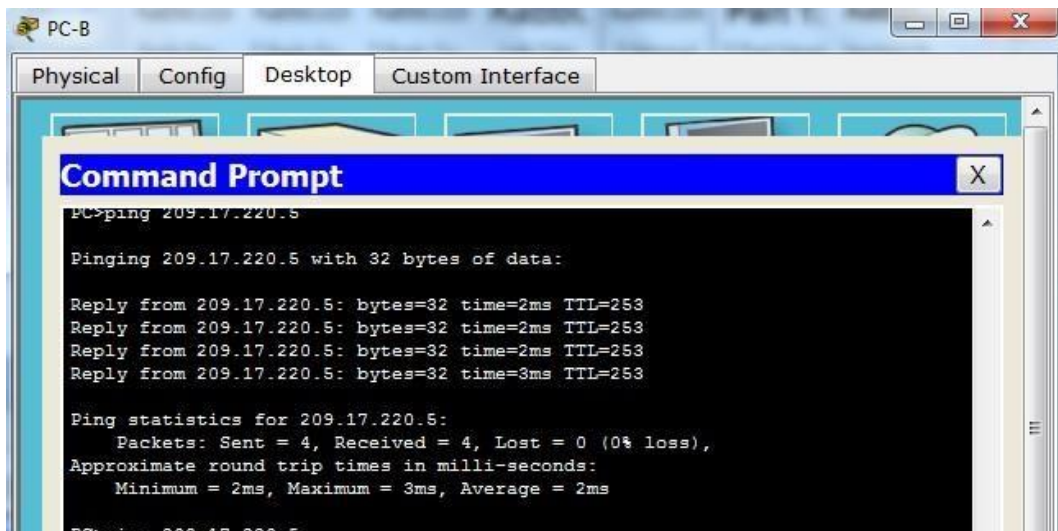
BOGOTA1(config-if)#ip nat inside BOGOTA1(config-if)#interface s0/0/0

BOGOTA1(config-if)#ip nat outside BOGOTA1(config-if)#

BOGOTA1(config-if)#end

BOGOTA1#

Hacemos ping desde PC-B a la dirección del ISP 209.17.220.5



The image shows a screenshot of a PC window titled "PC-B" with tabs for "Physical", "Config", "Desktop", and "Custom Interface". A "Command Prompt" window is open, displaying the following text:

```
PC>ping 209.17.220.5
Pinging 209.17.220.5 with 32 bytes of data:
Reply from 209.17.220.5: bytes=32 time=2ms TTL=253
Reply from 209.17.220.5: bytes=32 time=2ms TTL=253
Reply from 209.17.220.5: bytes=32 time=2ms TTL=253
Reply from 209.17.220.5: bytes=32 time=3ms TTL=253

Ping statistics for 209.17.220.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 3ms, Average = 2ms
PC>ping 209.17.220.5
```

```

BOGOTA1#show ip nat statistics
Total translations: 4 (0 static, 4 dynamic, 4 extended)
Outside Interfaces: Serial0/0/0
Inside Interfaces: Serial0/0/1 , Serial0/1/0 , Serial0/1/1
Hits: 4 Misses: 4
Expired translations: 0
Dynamic mappings:
BOGOTA1#

```

#show ip nat translations

```

BOGOTA1#show ip nat statistics
Total translations: 4 (0 static, 4 dynamic, 4 extended)
Outside Interfaces: Serial0/0/0
Inside Interfaces: Serial0/0/1 , Serial0/1/0 , Serial0/1/1
Hits: 4 Misses: 4
Expired translations: 0
Dynamic mappings:
BOGOTA1#
BOGOTA1#show ip nat translations
Pro  Inside global  Inside local  Outside local  Outside global
icmp 209.17.220.6:21 172.29.0.6:21 209.17.220.5:21 209.17.220.5:21
icmp 209.17.220.6:22 172.29.0.6:22 209.17.220.5:22 209.17.220.5:22
icmp 209.17.220.6:23 172.29.0.6:23 209.17.220.5:23 209.17.220.5:23
icmp 209.17.220.6:24 172.29.0.6:24 209.17.220.5:24 209.17.220.5:24

```

Parte 7: Configuración del servicio DHCP.

Configurar la red Medellín2 y Medellín3 donde el router Medellín 2 debe ser el servidor DHCP para ambas redes Lan.

```

MEDELLIN2(config)#ip dhcp excluded-address 172.29.4.1 172.29.4.5
MEDELLIN2(config)#ip dhcp excluded-address 172.29.4.129 172.29.4.133

```

```

MEDELLIN2(config)#ip dhcp pool R-MEDELLIN2
MEDELLIN2(dhcp-config)#network 172.29.4.0 255.255.255.128

```

```

MEDELLIN2(dhcp-config)#default-router 172.29.4.1

```

```
MEDELLIN2(dhcp-config)#dns-server 8.8.8.8 MEDELLIN2(dhcp-config)#exit
MEDELLIN2(config)#
```

```
MEDELLIN2(config)#ip dhcp pool R-MEDELLIN3
```

```
MEDELLIN2(dhcp-config)#network 172.29.4.128 255.255.255.128
```

```
MEDELLIN2(dhcp-config)#default-router 172.29.4.129
```

```
MEDELLIN2(dhcp-config)#dns-server 8.8.8.8 MEDELLIN2(dhcp-config)#exit
MEDELLIN2(config)#
```

```
MEDELLIN3#config t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
MEDELLIN3(config)#interface g0/1
```

```
MEDELLIN3(config-if)#ip helper-address 172.29.6.5 MEDELLIN3(config-
if)#
```

El router Medellín3 deberá habilitar el paso de los mensajes broadcast hacia la IP del router Medellín2.

Configurar la red Bogotá2 y Bogotá3 donde el router Medellín2 debe ser el servidor DHCP para ambas redes Lan.

```
BOGOTA2(config)#ip dhcp excluded-address 172.29.1.1 172.29.1.5
```

```
BOGOTA2(config)#ip dhcp excluded-address 172.29.0.1 172.29.0.5
```

```
BOGOTA2(config)#ip dhcp pool R-BOGOTA2
```

```
BOGOTA2(dhcp-config)#network 172.29.1.0 255.255.255.0
```

```
BBOGOTA2(dhcp-config)#default-router 172.29.1.1
```

```
BOGOTA2(dhcp-config)#dns-server 8.8.8.8 BOGOTA2(dhcp-config)#exit
```

```
BOGOTA2(config)#ip dhcp pool R-BOGOTA3
```

```
BOGOTA2(dhcp-config)#network 172.29.0.0 255.255.255.0
```

```
BOGOTA2(dhcp-config)#default-router 172.29.0.1
```

```
BOGOTA2(dhcp-config)#dns-server 8.8.8.8 BOGOTA2(dhcp-config)#exit
```

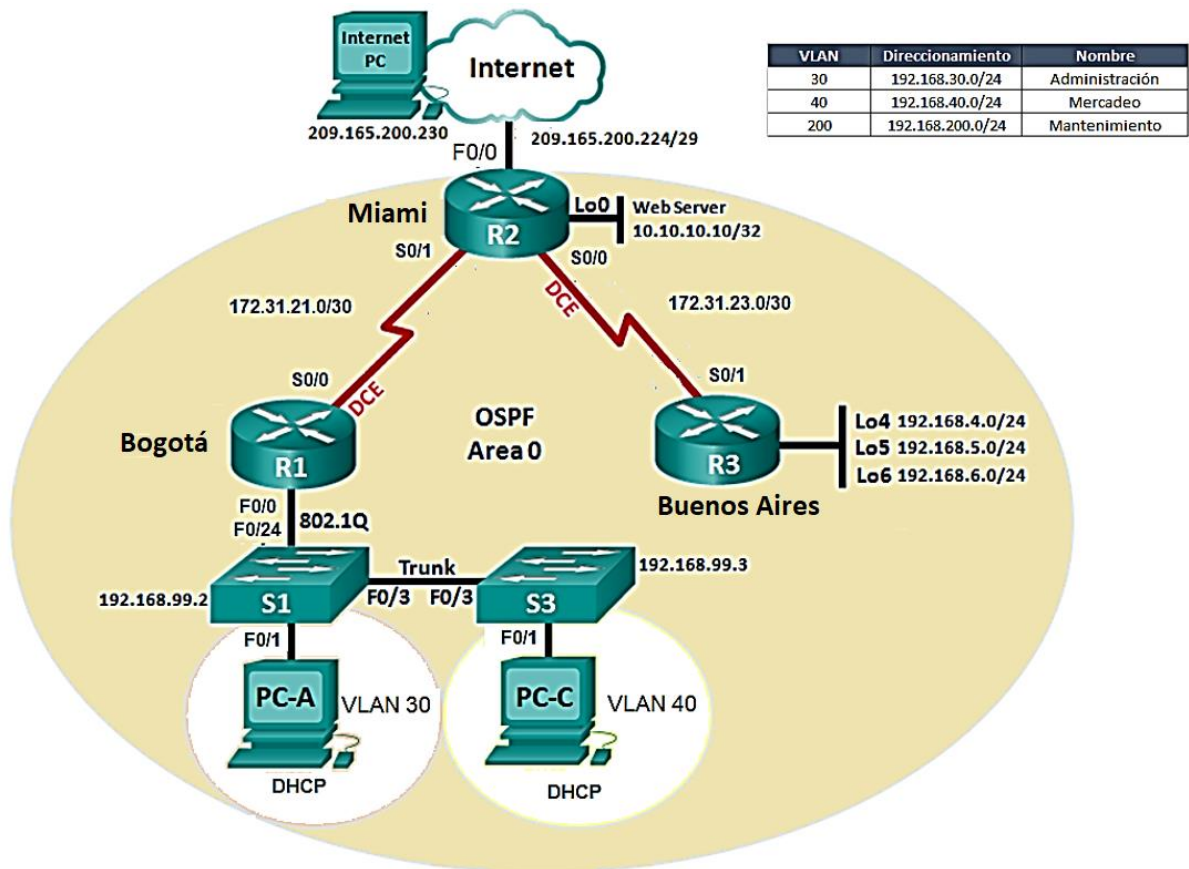
```
BOGOTA2(config)# BOGOTA3(config)#interface g0/1
```

```
BOGOTA3(config-if)#ip helper-address 172.29.3.13 BOGOTA3(config-
if)#exit
```

## DESARROLLO ESCENARIO 2

### Escenario 2

Escenario: Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.



Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario

Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

Verificar información de OSPF

Visualizar tablas de enrutamiento y routers conectados por OSPFv2

Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface

Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.

Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.

En el Switch 3 deshabilitar DNS lookup

Asignar direcciones IP a los Switches acorde a los lineamientos.

Desactivar todas las interfaces que no sean utilizadas en el esquema de red.

Implement DHCP and NAT for IPv4



Configurar R1 como servidor DHCP para las VLANs 30 y 40.

Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.

Configurar DHCP pool para VLAN 30	Name: ADMINISTRACION DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.
Configurar DHCP pool para VLAN 40	Name: MERCADEO DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.

Configurar NAT en R2 para permitir que los host puedan salir a internet

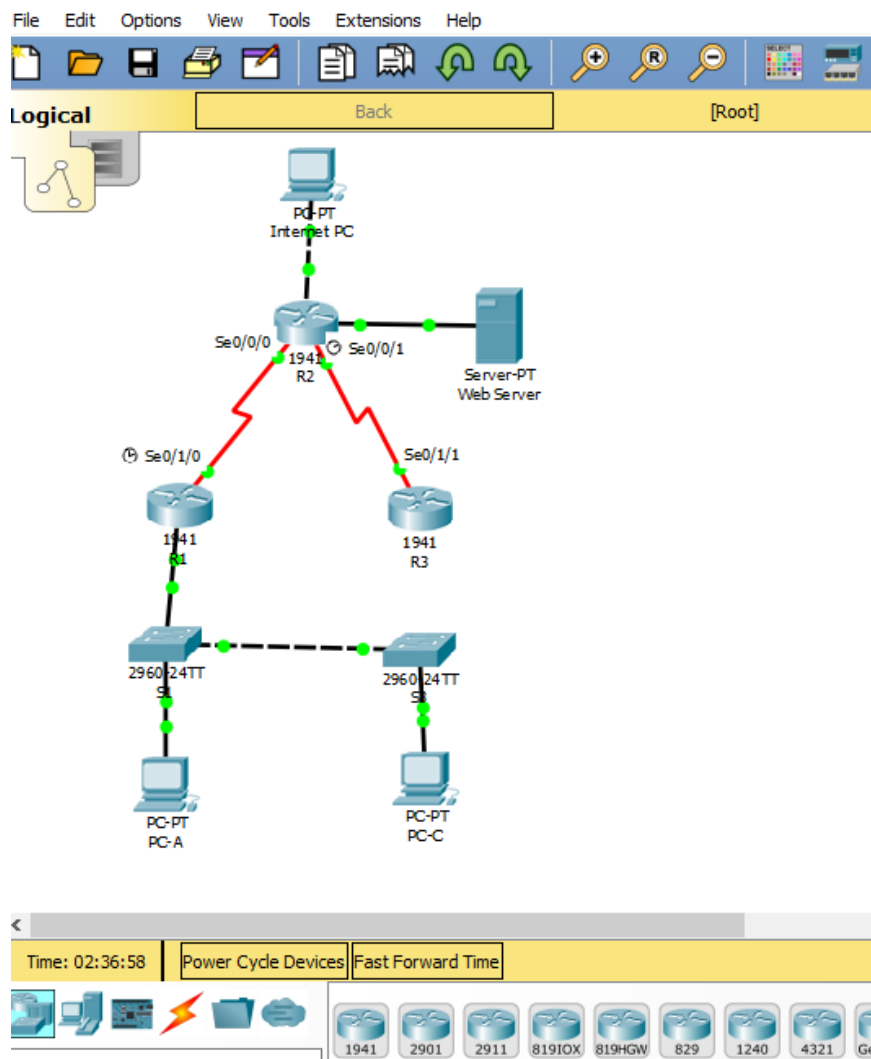
Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

## SOLUCIÓN

Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario



## PC-A

The screenshot shows the configuration window for PC-A. The 'Config' tab is selected. The 'IP Configuration' section is highlighted in blue. Under 'IP Configuration', the 'DHCP' radio button is selected. The fields are: IP Address (192.168.30.31), Subnet Mask (255.255.255.0), Default Gateway (192.168.30.1), and DNS Server (10.10.10.11). Under 'IPv6 Configuration', the 'Static' radio button is selected. The fields are: IPv6 Address (empty), Link Local Address (FE80::20A:F3FF:FE58:C102), IPv6 Gateway (empty), and IPv6 DNS Server (empty). A 'Top' button is at the bottom left.

Field	Value
IP Address	192.168.30.31
Subnet Mask	255.255.255.0
Default Gateway	192.168.30.1
DNS Server	10.10.10.11
IPv6 Address	
Link Local Address	FE80::20A:F3FF:FE58:C102
IPv6 Gateway	
IPv6 DNS Server	

## PC-C

The screenshot shows the configuration window for PC-C. The 'Config' tab is selected. The 'IP Configuration' section is highlighted in blue. Under 'IP Configuration', the 'DHCP' radio button is selected. The fields are: IP Address (192.168.40.31), Subnet Mask (255.255.255.0), Default Gateway (192.168.40.1), and DNS Server (10.10.10.11). Under 'IPv6 Configuration', the 'Static' radio button is selected. The fields are: IPv6 Address (empty), Link Local Address (FE80::20A:41FF:FE43:E01A), IPv6 Gateway (empty), and IPv6 DNS Server (empty). A 'Top' button is at the bottom left.

Field	Value
IP Address	192.168.40.31
Subnet Mask	255.255.255.0
Default Gateway	192.168.40.1
DNS Server	10.10.10.11
IPv6 Address	
Link Local Address	FE80::20A:41FF:FE43:E01A
IPv6 Gateway	
IPv6 DNS Server	

## INTERNET PC

The screenshot shows the configuration window for an Internet PC. The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The IP Configuration section is active, showing options for DHCP and Static IP. The Static IP is selected with the following values: IP Address: 209.165.200.230, Subnet Mask: 255.255.255.248, Default Gateway: 209.169.200.225, and DNS Server: 0.0.0.0. The IPv6 Configuration section is also visible, with options for DHCP, Auto Config, and Static. The Static option is selected, and the Link Local Address is set to FE80::2D0:BCFF:FEE5:AA69.

Field	Value
IP Configuration Mode	Static
IP Address	209.165.200.230
Subnet Mask	255.255.255.248
Default Gateway	209.169.200.225
DNS Server	0.0.0.0
IPv6 Configuration Mode	Static
IPv6 Address	
Link Local Address	FE80::2D0:BCFF:FEE5:AA69
IPv6 Gateway	
IPv6 DNS Server	

## WEBSERVER

### Creación de la vlan 30 en S1

The screenshot shows the configuration window for a Web Server. The window has tabs for Physical, Config, Services, Desktop, Programming, and Attributes. The IP Configuration section is active, showing options for DHCP and Static IP. The Static IP is selected with the following values: IP Address: 10.10.10.10, Subnet Mask: 255.255.255.0, Default Gateway: 10.10.10.1, and DNS Server: 0.0.0.0. The IPv6 Configuration section is also visible, with options for DHCP, Auto Config, and Static. The Static option is selected, and the Link Local Address is set to FE80::202:17FF:FED1:8CA9.

Field	Value
IP Configuration Mode	Static
IP Address	10.10.10.10
Subnet Mask	255.255.255.0
Default Gateway	10.10.10.1
DNS Server	0.0.0.0
IPv6 Configuration Mode	Static
IPv6 Address	
Link Local Address	FE80::202:17FF:FED1:8CA9
IPv6 Gateway	
IPv6 DNS Server	

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 30
Switch(config-vlan)#name ADMINISTRACION
Switch(config-vlan)#exit
Switch(config)#int f0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#no shut
Switch(config-if)#exit
Switch(config)#exit
Switch#
```

Asignación de ip a la vlan 30 en S1

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int vlan 30
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to
up
```

```
Switch(config-if)#ip address 192.168.30.0 255.255.255.0
Bad mask /24 for address 192.168.30.0
Switch(config-if)#ip address 192.168.30.0 255.255.0.0
Switch(config-if)#
```

Creación de vlan 40 en S3

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 40
Switch(config-vlan)#name MERCADEO
Switch(config-vlan)#exit
Switch(config)#int f0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 40
Switch(config-if)#no shut
Switch(config-if)#exit
Switch(config)#exit
Switch#
```

Asignación de la IP a la vlan 40 en S3

```
Switch>
```

```
Switch>en
```

```
Switch#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Switch(config)#int vlan 40
```

```
Switch(config-if)#
```

```
%LINK-5-CHANGED: Interface Vlan40, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan40, changed state to up
```

```
Switch(config-if)#ip address 192.168.40.0 255.255.0.0
```

```
Switch(config-if)#no shut
```

```
Switch(config-if)#exit
```

```
Switch(config)#exit
```

```
Switch#
```

Configuración del enlace troncal entre S1 y S3

```
Switch#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Switch(config)#int f0/3
```

```
Switch(config-if)#switchport mode trunk
```

## Configuración del Router R1

```
Router>en
```

```
Router#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#int f0/0
```

```
Router(config-if)#ip add 192.168.99.1 255.255.255.0
```

```
Router(config-if)#no shut
```

```
Router(config-if)#exit
```

```
Router(config)#int s0/0
```

```
%Invalid interface type and number
```

```
Router(config)#int s0/0/0
```

```
Router(config-if)#ip add 172.31.21.1
```

```
% Incomplete command.
```

```
Router(config-if)#ip add 172.31.21.1 255.255.0.0
```

```
Router(config-if)#no shut
```

## Configuración del Router R3

```
Router#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#int s0/0/1
```

```
Router(config-if)#ip add 172.31.23.1 255.255.0.0
```

```
Router(config-if)#no shut
```

```
Router(config-if)#
```



### Configuración de las LoopBack en R3

```
Router#conf t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#int loopback 4
```

```
Router(config-if)#
```

```
%LINK-5-CHANGED: Interface Loopback4, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up
```

```
Router(config-if)#ip add 192.168.4.0 255.255.0.0
```

```
Router(config-if)#no shut
```

```
Router(config-if)#exit
```

```
Router(config)#int loopback 5
```

```
Router(config-if)#
```

```
%LINK-5-CHANGED: Interface Loopback5, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state to up
```

```
Router(config-if)#ip add 192.168.5.0 255.255.0.0
```

```
% 192.168.0.0 overlaps with Loopback4
```

```
Router(config-if)#no shut
```

```
Router(config-if)#exit
```

```
Router(config)#int loopback 6
```

Router(config-if)#

%LINK-5-CHANGED: Interface Loopback6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state to up

Router(config-if)#ip add 192.168.6.0 255.255.0.0

% 192.168.0.0 overlaps with Loopback4 (me muestra error)

Router(config-if)#ip add 192.168.6.0 255.255.255.0

Bad mask /24 for address 192.168.6.0

Router(config-if)#ip add 192.168.6.0 255.255.0.0

% 192.168.0.0 overlaps with Loopback4 (me muestra error)

Router(config-if)#no shut

Router(config-if)#exit

Router(config)#exit

Router#

%SYS-5-CONFIG\_I: Configured from console by console

Router#

Configuración del Router 2

Router(config)#int s0/0/1

Router(config-if)#ip add 172.31.21.2 255.255.0.0

Router(config-if)#no shut

Router(config-if)#exit

```
Router(config)#int s0/0/0
Router(config-if)#ip add 172.31.23.1 255.255.255.0
% 172.31.23.0 overlaps with Serial0/0/1 (me muestra error)
```

## Configuración de la LoopBack del Router 2

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int loopback 0

Router(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state
to up

Router(config-if)#ip dd 10.10.10.10 255.0.0.0
^
% Invalid input detected at '^' marker.
Router(config-if)#ip add 10.10.10.10 255.0.0.0
```

**Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:**

OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

En Router 1:

```
Router(config)#router ospf 1
```

```
Router(config-router)#network 192.168.99.0 %IP-4-DUPADDR: Duplicate address 192.168.99.1 on FastEthernet0/0, sourced by 0060.471E.A321
```

```
% Incomplete command.
```

```
Router(config-router)#network 192.168.99.0 0.0.0.255 area 0
```

```
Router(config-router)#
```

```
Router#
```

```
%SYS-5-CONFIG_I: Configured from console by console
```

```
Router#router ospf 1
```

```
^
```

```
% Invalid input detected at '^' marker.
```

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 172.31.21.0 0.0.255.255 area 0
Router(config-router)#network 172.31.23.0 0.0.255.255 area 0
Router(config-router)#network 209.165.200.224 0.0.0.255 area 0
Router(config-router)#
```

En Router 2:

```
Router(config)#router ospf 1
Router(config-router)#network 209.165.200.224 0.0.0.255 area 0
^
% Invalid input detected at '^' marker.
Router(config-router)#network 209.165.200.224 0.0.0.255 area 0
Router(config-router)#network 172.31.21.0 0.0.255.255 area 0
Router(config-router)#network 172.31.23.0 0.0.255.255 area 0
01:00:13: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.99.1 on Serial0/0/1 from
LOADING to FULL, Loading Done

Router(config-router)#network 172.31.23.0 0.0.255.255 area 0
Router(config-router)#
Router#
```

En Router 3:

```
Router>en
```

```
Router#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#router ospf 1
```

```
Router(config-router)#network 172.31.23.0 0.0.255.255 area 0
```

```
Router(config-router)#network 172.31.21.0 0.0.255.255 area 0
```

```
Router(config-router)#network 209.165.200.224 0.0.0.255 area 0
```

```
Router(config-router)#
```

Verificar información de OSPF

Visualizar tablas de enrutamiento y routers conectados por OSPFv2

En Router 1:

```
Router#show ip route
```

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

O 172.0.0.0/16 [110/128] via 172.31.21.2, 00:33:16, Serial0/0/0  
C 172.31.0.0/16 is directly connected, Serial0/0/0  
C 192.168.99.0/24 is directly connected, FastEthernet0/0  
O 209.165.200.0/24 [110/65] via 172.31.21.2, 01:14:23, Serial0/0/0

En Router 2:

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP  
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area  
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2  
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP  
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Loopback0  
C 172.0.0.0/16 is directly connected, Serial0/0/0  
C 172.31.0.0/16 is directly connected, Serial0/0/1  
O 192.168.99.0/24 [110/65] via 172.31.21.1, 01:15:30, Serial0/0/1  
C 209.165.200.0/24 is directly connected, FastEthernet0/0

En Router 3:

```
Router>en
```

```
Router#show ip route
```

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

```
C 172.0.0.0/16 is directly connected, Serial0/0/1
```

```
O 172.31.0.0/16 [110/128] via 172.0.0.1, 00:34:24, Serial0/0/1
```

```
C 192.168.0.0/16 is directly connected, Loopback4
```

```
O 192.168.99.0/24 [110/129] via 172.0.0.1, 00:34:24, Serial0/0/1
```

```
O 209.165.200.0/24 [110/65] via 172.0.0.1, 00:34:24, Serial0/0/1
```

Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface



En Router 1:

```
Router#show ip ospf int
```

```
FastEthernet0/0 is up, line protocol is up
```

```
Internet address is 192.168.99.1/24, Area 0
```

```
Process ID 1, Router ID 192.168.99.1, Network Type BROADCAST, Cost: 1
```

```
Transmit Delay is 1 sec, State DR, Priority 1
```

```
Designated Router (ID) 192.168.99.1, Interface address 192.168.99.1
```

```
No backup designated router on this network
```

```
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
```

```
Hello due in 00:00:09
```

```
Index 1/1, flood queue length 0
```

```
Next 0x0(0)/0x0(0)
```

```
Last flood scan length is 1, maximum is 1
```

```
Last flood scan time is 0 msec, maximum is 0 msec
```

```
Neighbor Count is 0, Adjacent neighbor count is 0
```

```
Suppress hello for 0 neighbor(s)
```

```
Serial0/0/0 is up, line protocol is up
```

```
Internet address is 172.31.21.1/16, Area 0
```

```
Process ID 1, Router ID 192.168.99.1, Network Type POINT-TO-POINT, Cost: 64
```

```
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
```

```
No designated router on this network
```

```
No backup designated router on this network
```

```
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
```

```
Hello due in 00:00:08
```

```
Index 2/2, flood queue length 0
```

```
Next 0x0(0)/0x0(0)
```

Last flood scan length is 1, maximum is 1  
Last flood scan time is 0 msec, maximum is 0 msec  
Neighbor Count is 1 , Adjacent neighbor count is 1  
Adjacent with neighbor 10.10.10.10  
Suppress hello for 0 neighbor(s)

En Router 2:

Router#show ip ospf int

FastEthernet0/0 is up, line protocol is up  
Internet address is 209.165.200.225/24, Area 0  
Process ID 1, Router ID 10.10.10.10, Network Type BROADCAST, Cost: 1  
Transmit Delay is 1 sec, State DR, Priority 1  
Designated Router (ID) 10.10.10.10, Interface address 209.165.200.225  
No backup designated router on this network  
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5  
Hello due in 00:00:01  
Index 1/1, flood queue length 0  
Next 0x0(0)/0x0(0)  
Last flood scan length is 1, maximum is 1  
Last flood scan time is 0 msec, maximum is 0 msec  
Neighbor Count is 0, Adjacent neighbor count is 0  
Suppress hello for 0 neighbor(s)  
Serial0/0/1 is up, line protocol is up  
Internet address is 172.31.21.2/16, Area 0

Process ID 1, Router ID 10.10.10.10, Network Type POINT-TO-POINT, Cost: 64  
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0  
No designated router on this network  
No backup designated router on this network  
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5  
Hello due in 00:00:01  
Index 2/2, flood queue length 0  
Next 0x0(0)/0x0(0)  
Last flood scan length is 1, maximum is 1  
Last flood scan time is 0 msec, maximum is 0 msec  
Neighbor Count is 1 , Adjacent neighbor count is 1  
Adjacent with neighbor 192.168.99.1  
Suppress hello for 0 neighbor(s)  
Serial0/0/0 is up, line protocol is up  
Internet address is 172.0.0.1/16, Area 0  
Process ID 1, Router ID 10.10.10.10, Network Type POINT-TO-POINT, Cost: 64  
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0  
No designated router on this network  
No backup designated router on this network  
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5  
Hello due in 00:00:05  
Index 3/3, flood queue length 0  
Next 0x0(0)/0x0(0)  
Last flood scan length is 1, maximum is 1  
Last flood scan time is 0 msec, maximum is 0 msec  
Neighbor Count is 1 , Adjacent neighbor count is 1  
Adjacent with neighbor 192.168.4.0

Suppress hello for 0 neighbor(s)

En router 3:

Router#show ip ospf int

Serial0/0/1 is up, line protocol is up

Internet address is 172.0.0.2/16, Area 0

Process ID 1, Router ID 192.168.4.0, Network Type POINT-TO-POINT, Cost: 64

Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0

No designated router on this network

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:03

Index 1/1, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 1 , Adjacent neighbor count is 1

Adjacent with neighbor 10.10.10.10

Suppress hello for 0 neighbor(s)

Router#

Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.

En Router 1:

Router#show ip protocols

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 192.168.99.1

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

192.168.99.0 0.0.0.255 area 0

172.31.0.0 0.0.255.255 area 0

209.165.200.0 0.0.0.255 area 0

172.0.0.0 0.0.255.255 area 0

Routing Information Sources:

Gateway Distance Last Update

10.10.10.10 110 00:11:00

192.168.4.0 110 00:10:59

192.168.99.1 110 00:22:25

Distance: (default is 110)

En Router 2:

```
Router#show ip protocols
```

```
Routing Protocol is "ospf 1"
```

```
Outgoing update filter list for all interfaces is not set
```

```
Incoming update filter list for all interfaces is not set
```

```
Router ID 10.10.10.10
```

```
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
```

```
Maximum path: 4
```

```
Routing for Networks:
```

```
209.165.200.0 0.0.0.255 area 0
```

```
172.31.0.0 0.0.255.255 area 0
```

```
192.168.99.0 0.0.0.255 area 0
```

```
172.0.0.0 0.0.255.255 area 0
```

```
Routing Information Sources:
```

```
Gateway Distance Last Update
```

```
10.10.10.10 110 00:11:52
```

```
192.168.4.0 110 00:11:52
```

```
192.168.99.1 110 00:23:19
```

```
Distance: (default is 110)
```

En Router 3:

```
Router#show ip protocols
```

```
Routing Protocol is "ospf 1"
```

```
Outgoing update filter list for all interfaces is not set
```

```
Incoming update filter list for all interfaces is not set
```

```
Router ID 192.168.4.0
```

```
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
```

```
Maximum path: 4
```

```
Routing for Networks:
```

```
172.31.0.0 0.0.255.255 area 0
```

```
209.165.200.0 0.0.0.255 area 0
```

```
192.168.99.0 0.0.0.255 area 0
```

```
172.0.0.0 0.0.255.255 area 0
```

```
Routing Information Sources:
```

```
Gateway Distance Last Update
```

```
10.10.10.10 110 00:12:18
```

```
192.168.4.0 110 00:12:17
```

```
192.168.99.1 110 00:23:44
```

```
Distance: (default is 110)
```

Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.

```
R1
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int g0/1.30
R1(config-subif)#descrip Administracion
R1(config-subif)#en
R1(config-subif)#encapsulation d
R1(config-subif)#encapsulation dot1Q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
R1(config-subif)#int g0/1.40
R1(config-subif)#descrip Mercadeo
R1(config-subif)#encapsulation dot1Q 40
R1(config-subif)#ip address 192.168.40.1 255.255.255.0
R1(config-subif)#int g0/1.200
R1(config-subif)#descrip Mantenimient
^
% Invalid input detected at '^' marker.
R1(config-subif)#descrip Mantenimiento
R1(config-subif)#encapsulation dot1Q 200
R1(config-subif)#ip address 192.168.200.1 255.255.255.0
R1(config-subif)#exit
R1(config)#int g0/1
R1(config-if)#no shu

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
```



%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1,  
changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/1.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.30,  
changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/1.40, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.40,  
changed state to up

%LINK-5-CHANGED: Interface GigabitEthernet0/1.200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.200,  
changed state to up

S1

S1#conf t

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)#vlan 30

S1(config-vlan)#name Administracion

S1(config-vlan)#vlan 40

S1(config-vlan)#name Mercadeo

S1(config-vlan)#vlan 200

S1(config-vlan)#name Mantenimiento

```
S1(config-vlan)#  
S1(config-vlan)#exit  
S1(config)#int vlan 30  
S1(config-if)#  
%LINK-5-CHANGED: Interface Vlan30, changed state to up
```

```
S1(config-if)#ip address 192.168.99.2 255.255.255.0  
S1(config-if)#no shu  
S1(config-if)#exit  
S1(config)#ip default-gateway 192.168.99.1  
S1(config)#
```

```
S1>en
```

```
Password:
```

```
Password:
```

```
S1#conf t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
S1(config)#int f0/3
```

```
S1(config-if)#switchport mode trunk
```

```
S1(config-if)#
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed  
state to down
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed  
state to up
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up

S1(config-if)#switchport trunk native vlan 1

S1(config-if)#int f0/5

S1(config-if)#switchport mode trunk

S1(config-if)#switchport trunk native vlan 1

S1(config-if)#int range fa0/1-2, fa0/4, fa0/6-24,g1/1-2

interface range not validated - command rejected

S1(config)#int range fa0/1-2, fa0/4, fa0/6-24,g0/1-2

S1(config-if-range)#switchport mode access

S1(config-if-range)#int f0/6

S1(config-if)#switchport mode access

S1(config-if)#switchport access vlan 30

S3

S3>en

Password:

S3#conf t

Enter configuration commands, one per line. End with CNTL/Z.

S3(config)#

S3(config)#vlan 40

S3(config-vlan)#name Mercadeo

S3(config-vlan)#vlan 30

S3(config-vlan)#name Administracion

S3(config-vlan)#vlan 200

S3(config-vlan)#name Mantenimiento

```
S3(config-vlan)#exit
```

```
S3(config)#int vlan 30
```

```
S3(config-if)#
```

```
%LINK-5-CHANGED: Interface Vlan30, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up
```

```
S3(config-if)#ip address 192.168.99.3 255.255.255.0
```

```
S3(config-if)#no shu
```

```
S3(config-if)#exit
```

```
S3(config)#ip default-gateway 192.168.99.1
```

```
S3(config)#int f0/3
```

```
S3(config-if)#sw
```

```
S3(config-if)#switchport mode trunk
```

```
S3(config-if)#switchport trunk native vlan 1
```

```
S3(config-if)#int range f0/1-2, f0/4-24, g0/1-2
```

```
S3(config-if-range)#switchport mode access
```

```
S3(config-if-range)#int f0/18
```

```
S3(config-if)#switchport mode access
```

```
S3(config-if)#switchport access vlan 40
```

En el Switch 3 deshabilitar DNS lookup

```
Switch>EN
```

```
Switch#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Switch(config)#no ip domain-lookup
```

```
Switch(config)#hostname S3
```

```
    S3(config)#
```

### **Asignar direcciones IP a los Switches acorde a los lineamientos.**

```
S1
```

```
S1(config)#int vlan 30
```

```
S1(config-if)#
```

```
%LINK-5-CHANGED: Interface Vlan30, changed state to up
```

```
S1(config-if)#ip address 192.168.99.2 255.255.255.0
```

```
S1(config-if)#no shu
```

```
S3
```

```
S3(config)#int vlan 30
```

```
S3(config-if)#
```

```
%LINK-5-CHANGED: Interface Vlan30, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up
```

```
S3(config-if)#ip address 192.168.99.3 255.255.255.0
```

```
S3(config-if)#no shu
```

```
S3(config-if)#exit
```

**Desactivar todas las interfaces que no sean utilizadas en el esquema de red.**

SI

```
S1(config-if)#int range fa0/1-2, fa0/4, fa0/7-24,g0/1-2
```

```
S1(config-if-range)#shutdown
```

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down

S1(config-if-range)#

S3

S3(config-if)#int range f0/1-2, f0/4-17, f0/19-24,g0/1-2

S3(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down



%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down

%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down

S3(config-if-range)#

Implement DHCP and NAT for IPv4

Configurar R1 como servidor DHCP para las VLANs 30 y 40.

Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.

R1

R1>en

Password:

R1#conf t

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#ip dhcp e

R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30

```
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
```

```
R1(config)#
```

Configurar DHCP pool para VLAN 30

Name: ADMINISTRACION DNS-Server: 10.10.10.11

Domain-Name: ccna-unad.com

Establecer default gateway.

```
R1(config)#ip dhcp pool ADMINISTRACION
```

```
R1(dhcp-config)#dn
```

```
R1(dhcp-config)#dns-server 10.10.10.11
```

```
R1(dhcp-config)#domain n
```

```
R1(dhcp-config)#domain n
```

```
R1(dhcp-config)#domain na
```

```
R1(dhcp-config)#?
```

default-router Default routers

dns-server Set name server

exit Exit from DHCP pool configuration mode

network Network number and mask

no Negate a command or set its defaults

option Raw DHCP options

Configurar DHCP pool para VLAN 40

Name: MERCADEO

DNS-Server: 10.10.10.11

Domain-Name: ccna-unad.com Establecer default gateway.

```
R1(dhcp-config)#ip dhcp pool MERCADEO
```

```
R1(dhcp-config)#DN
```

```
R1(dhcp-config)#DNs-server 10.10.10.11
```

```
R1(dhcp-config)#doma
```

```
R1(dhcp-config)#domain-name
```

```
^
```

```
% Invalid input detected at '^' marker.
```

```
R1(dhcp-config)#domain-name ccna-unad.com
```

```
^
```

```
% Invalid input detected at '^' marker.
```

```
R1(dhcp-config)#default-router 192.168.40.1
```

```
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
```

```
R1(dhcp-config)#
```

```
R1(dhcp-config)#
```

```
R1(dhcp-config)#default router 192.168.30.1
```

```
^
```

```
% Invalid input detected at '^' marker.
```

```
R1(dhcp-config)#default-router 192.168.30.1
```

```
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
```

Configurar NAT en R2 para permitir que los host puedan salir a internet

```
R2>en
```

```
Password:
```

```
R2#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
R2(config)#user webuser privilege 15 secret cisco12345
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
R2(config)#int g0/0
R2(config-if)#ip nat outside
R2(config-if)#int g0/1
R2(config-if)#ip nat inside
R2(config-if)#
```

```
R2(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.228 netmask
255.255.255.248
R2(config)#ip nat inside source list 1 pool INTERNET
R2(config)#
```

Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

R2

LISTA DE ACCESO QUE SOLO PERMITE TRAFICO DESDE LAS VLAN CREADAS Y LAS lop

```
R2(config)#access-list 1 permit 192.168.30.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.4.0 0.0.3.255
R2(config)#
```

LISTA DE ACCESO QUE SOLO PERMITE TRAFICO TELNET DE R1 A R2

```
R2(config)#ip access-list standard MANAGMENT
R2(config-std-nacl)#permit host 172.31.21.1
```

```
R2(config-std-nacl)#exit
R2(config)#line vty 0 4
R2(config-line)#access-class MANAGMENT in
R2(config-line)#
```

```
R3
R3(config)#access-list 1 permit any
R3(config)#
R3#
%SYS-5-CONFIG_I: Configured from console by console
```

Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

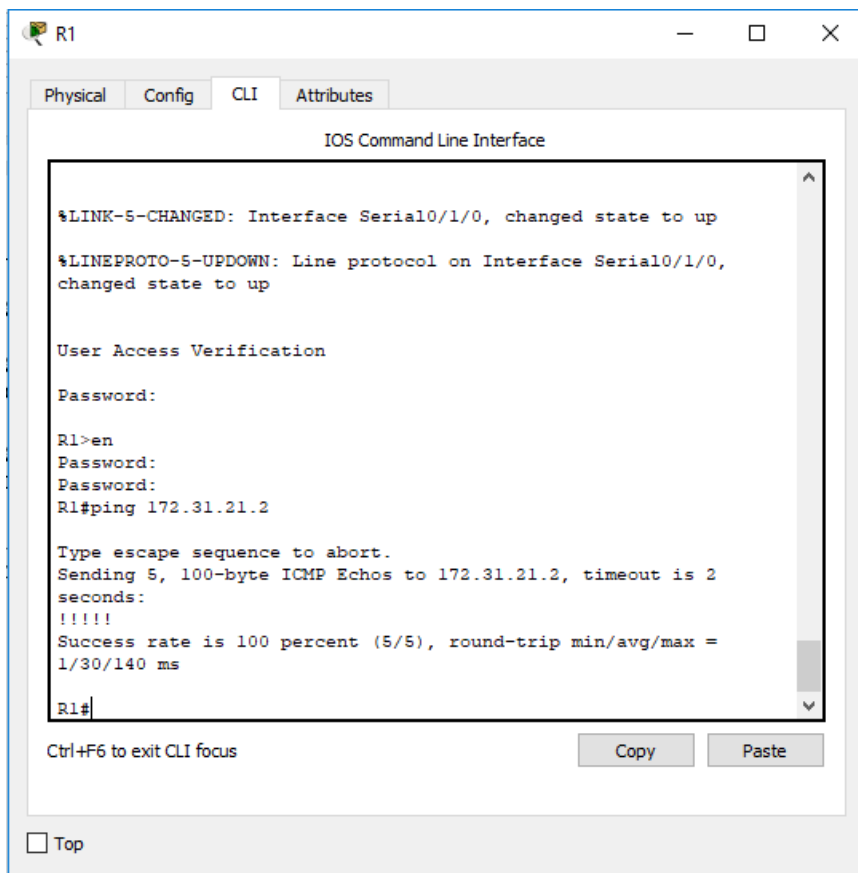
```
R2(config)#access-list 101 permit tcp any host 209.165.200.229 eq www
```

Lista de acceso para prevenir trafico ping de redes internas mientras se continua permitiendo a las interfaces lan ping a el pc internet

```
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#
R2(config)#int g0/0
R2(config-if)#ip
R2(config-if)#ip ac
R2(config-if)#ip access-group 101 in
R2(config-if)#int s0/0/0
R2(config-if)#ip access-group 101 out
```

```
R2(config-if)#int s0/0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#int g0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#
```

Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.



```
R1
Physical Config CLI Attributes
IOS Command Line Interface

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0,
changed state to up

User Access Verification

Password:

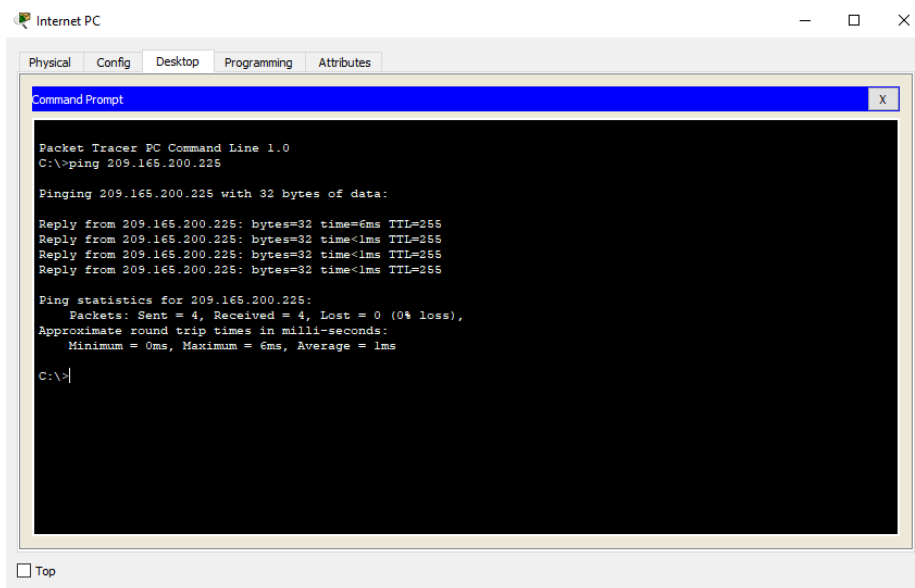
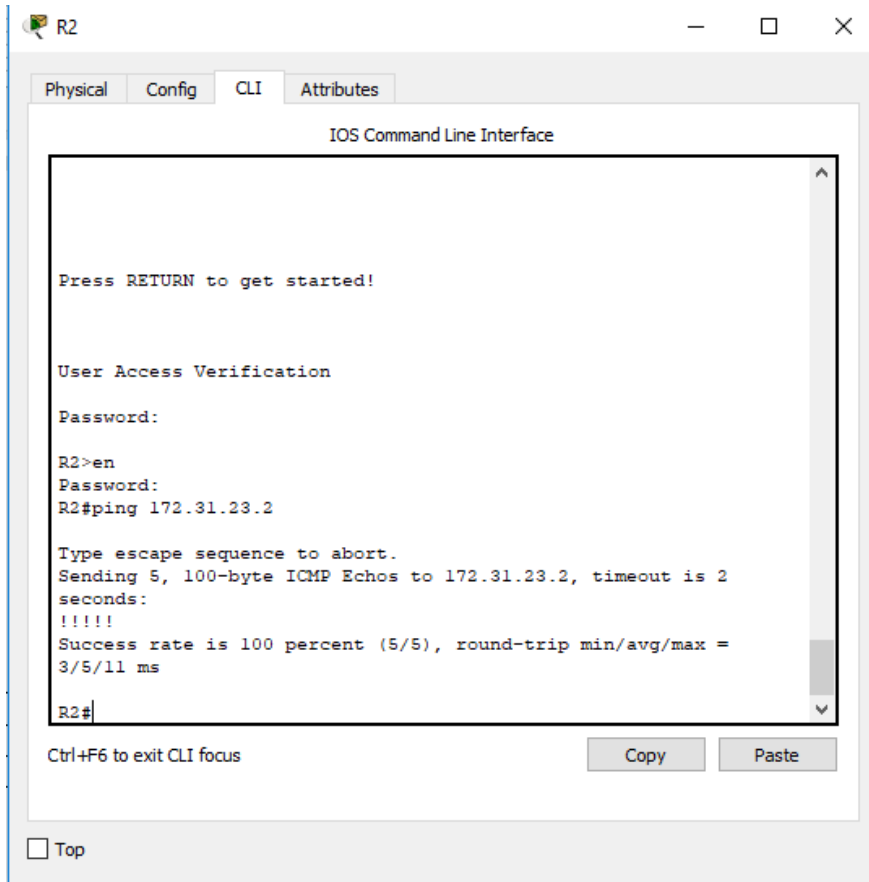
R1>en
Password:
Password:
R1#ping 172.31.21.2

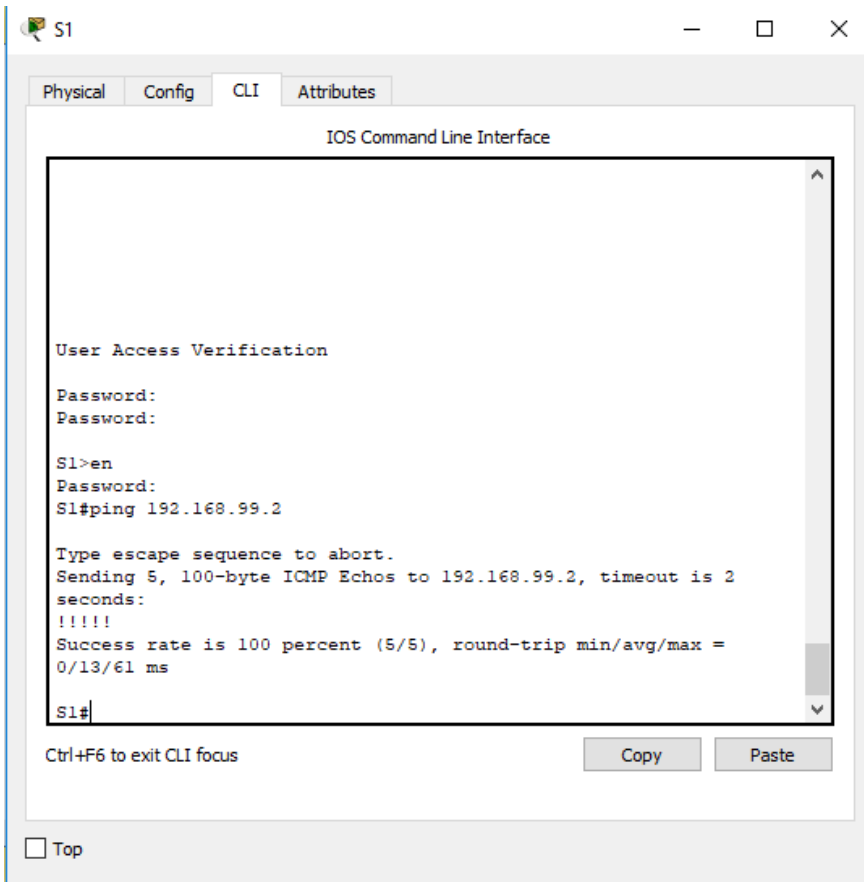
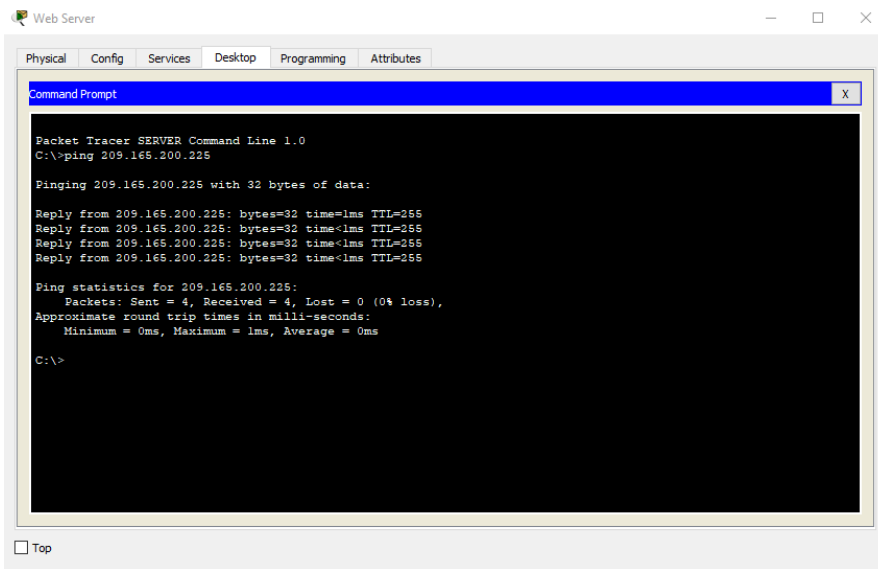
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.21.2, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max =
1/30/140 ms
R1#
```

Ctrl+F6 to exit CLI focus

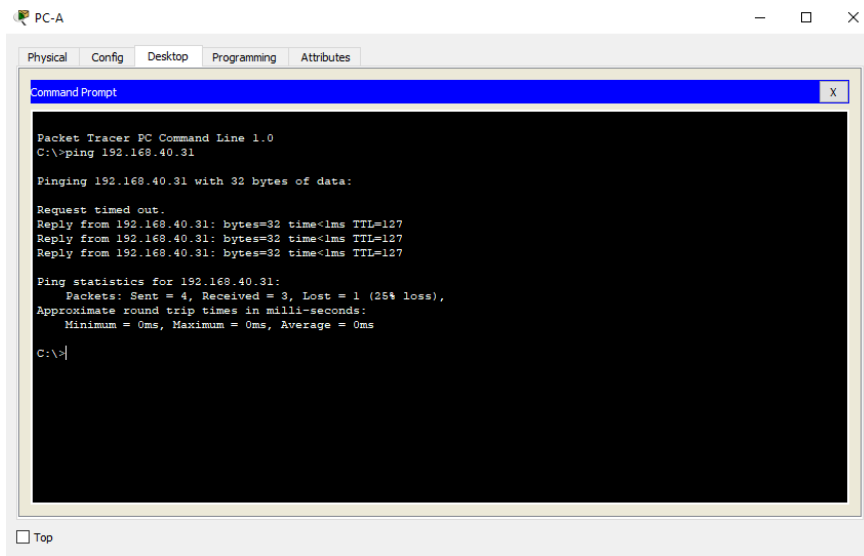
Copy Paste

Top









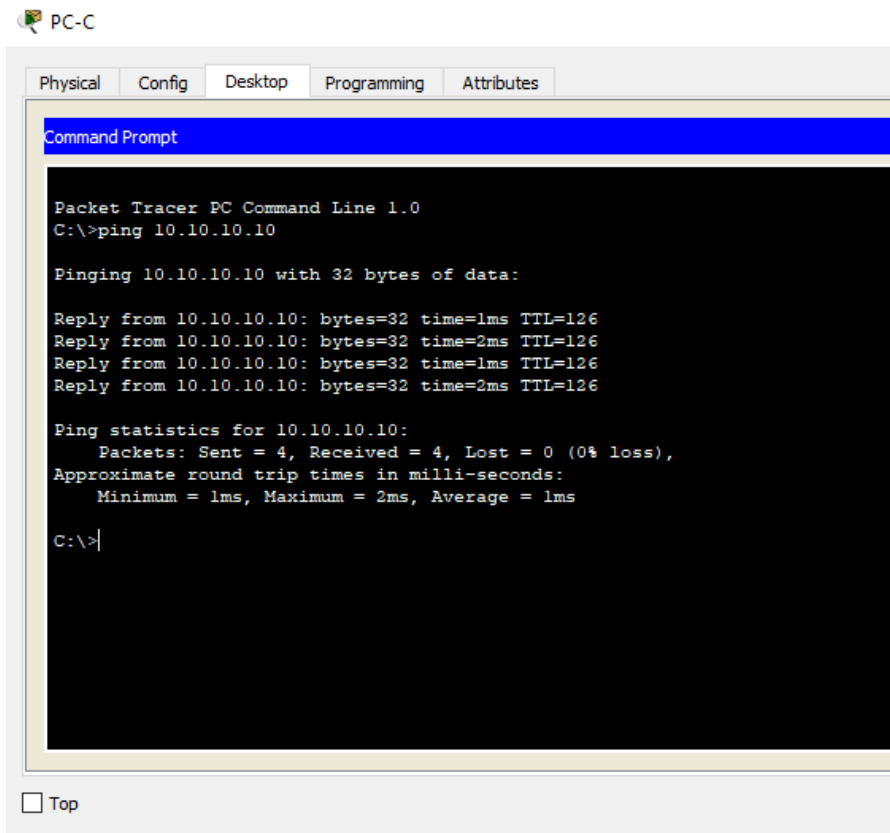
```
PC-A
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.40.31

Pinging 192.168.40.31 with 32 bytes of data:

Request timed out.
Reply from 192.168.40.31: bytes=32 time<1ms TTL=127
Reply from 192.168.40.31: bytes=32 time<1ms TTL=127
Reply from 192.168.40.31: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.40.31:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```



```
PC-C
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 10.10.10.10

Pinging 10.10.10.10 with 32 bytes of data:

Reply from 10.10.10.10: bytes=32 time=1ms TTL=126
Reply from 10.10.10.10: bytes=32 time=2ms TTL=126
Reply from 10.10.10.10: bytes=32 time=1ms TTL=126
Reply from 10.10.10.10: bytes=32 time=2ms TTL=126

Ping statistics for 10.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>
```

## CONCLUSIÓN

Esta actividad permitió desarrollar la capacidad de configurar y administrar los dispositivos que integran la red, haciendo uso de la tecnología de networking virtual (VLAN). Logrando comprender los beneficios de seguridad, reducción de costos, la administración de aplicaciones o proyectos. Que brinda esta tecnología.

Packet tracer es la herramienta clave para el aprendizaje e implementación autónoma de redes.

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<https://static-courseassets.s3.amazonaws.com/RSE50ES/module9/index.html#9.0.1.1>

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